Europe?s bid for leadership in photonic chips begins in Barcelona

On May 21st, Barcelona will host PIXEurope Connect, an event that will spotlight a 400 million euros European initiative to accelerate the fast-growing photonic chip market and strengthen European technological sovereignty.

May 20, 2026

On May 21st, 2026, Barcelona will host the **PIXEurope Connect - Industry Ecosystem Building Day**, a flagship event aimed at gathering leading experts in the photonics field, with institutional representatives and industry stakeholders to align vision and expertise, and reinforce the outstanding technological potential and transformative capacity that the PIXEurope Pilot Line will have in accelerating collaborations and drive innovation in photonic chip technologies in Europe.

Hosted at Torre Glories, Barcelona, the one-day meeting will bring together key stakeholders from across the semiconductor and photonics landscape, including policymakers, researchers, manufacturers, and end-users, to strengthen Europe's position in next-generation chip development and secure Europe's technological sovereignty in the

photonic chips industry.

This landmark event will count on the presence of **Oscar Lopez Agueda**, Spain's Minister for Digital Transformation and Civil Service, **Nuria Montserrat**, Minister for Research and Universities of the Government of Catalonia, **Jari Kinaret**, Executive Director of the Chips Joint Undertaking, **Werner Steinhogl**, Head of Sector in Unit Microelectronics and Photonics Industry from the European Commission, and **Oriol Romero?Isart**, Director of ICFO, coordinating institution of the PIXEurope Pilot Line. Together, they will be highlighting, at an institutional, national, and European leadership position, the strong commitment of these institutions in advancing Europe's semiconductor and photonic integrated chip strategy.

Why Integrated Photonics?

We live in an increasingly digital world where almost all online activities rely on large-scale data storage and processing centers. These data centers require enormous amounts of energy, not only to run computing operations but also to maintain cooling systems. Today, they account for around 1.5% of global electricity consumption, a figure projected by the International Energy Agency (IEA) to double by 2030 - equivalent to Japan's entire annual electricity use - and potentially quadruple by 2035.

The IEA warns that this expansion is already running into physical bottlenecks: supply chains for key energy components have tightened, and energy grid infrastructure approval processes are being strained by the volume of new projects. The agency estimates that without significant infrastructure investment, up to 20% of planned data center projects could face delays. Meeting the energy demands of the digital economy without compromising climate commitments or economic competitiveness will require a fundamental shift in how data centers consume energy. In this context, the integration of photonic chips or **photonic integrated circuits (PICs)** into strategic technology roadmaps becomes essential. Photonic chips use light instead of electricity to transport and process information inside circuits. This allows much faster communications with significantly lower energy consumption than conventional electronic chips. For this reason, photonic chips could reduce energy consumption in data centers by 30% or more, while improving speed and scalability and also generating significantly less heat and reducing cooling requirements.

The photonic chips industry is also expected to grow up to **800% in market growth** over next decade, as demand rises for faster and more efficient computing. By enabling faster and more energy?efficient data transmission and processing, PICs offer a path to overcoming the limitations of conventional electronic solutions while securing long?term competitiveness in an energy?constrained digital world.

In addition to computing, photonic chips are expected to enable breakthroughs in medical diagnostics, LiDAR sensing, telecommunications, quantum information technologies, and quantum computing - in each case because their core properties (speed, precision, miniaturization, and low energy consumption) address limitations that conventional electronic chips cannot overcome. The following are only some examples: In medical

diagnostics, PIC-based biosensors can detect biological markers such as proteins or DNA sequences with high specificity, enabling high-precision point-of-care diagnostic devices outside traditional laboratory settings. In autonomous vehicles, PIC-based LiDAR systems are being developed to improve performance and reduce cost compared to conventional mechanical systems. In quantum computing, PICs provide the precise control of photonic qubits necessary for quantum information processing.

Overview of the event

The event is designed to demonstrate how PIXEurope can bridge the gap between research and industrial deployment of photonic chips, with a strong focus on industry and real-world applications. The program will show how PIXEurope can help companies develop photonic chips faster by giving access to shared expertise, advanced facilities, prototyping, manufacturing, testing, and specialized training.

The day aims to bring together suppliers, designers, manufacturers, and technology companies to discuss **industry and market needs and challenges**, build partnerships, foster collaborations, and demonstrate how the Pilot Line and the broader PIXEurope ecosystem may support and facilitate the journey from lab to fab.

Advancing Europe's Photonic and Semiconductor Future

PIXEurope has the potential to become a key enabler of **Europe's technological sovereignty** and **competitiveness** in photonic integrated chips, addressing the urgent need for more powerful, scalable, and energy?efficient technologies in an increasingly digital world.

The initiative's **open-access model** is designed to **bridge the gap** between research and commercialization, helping companies scale innovations more efficiently. By providing this open access to advanced infrastructure, collaborative R&D capabilities and facilitating expertise for the entire value chain, the PIXEurope Pilot Line **bridges the gap** between cutting?edge research and industrial deployment, enabling **faster innovation and market uptake**. Strongly backed by regional, national, and European institutions, PIXEurope is set to play a decisive role in **strengthening Europe's semiconductor and photonics ecosystem**, supporting industry growth, reducing energy impacts, and positioning Europe at the forefront of next?generation chip technologies.

As global competition intensifies in advanced chip technologies, the Barcelona gathering is expected to serve as a catalyst for new partnerships and reinforce Europe's commitment to leadership in integrated photonics and broader ambition to build a resilient and competitive semiconductor ecosystem.

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About PIXEurope

PIXEurope is the fifth Pilot Line initiative launched through the Chips Joint Undertaking, established under the EU Chips Act, to accelerate the development of photonic integrated circuit (PIC) technology, a critical enabler for high-speed computing, communications,

quantum information systems, and beyond. The Pilot Line is a shared European industrial platform where companies (from startups to large corporations) can design, prototype, test, and validate photonic chips more quickly and at lower risk before large-scale manufacturing. It will be Europe's first fully integrated, distributed Pilot Line connecting the entire PIC value chain, from design and fabrication to integration, packaging, and testing, across multiple coordinated European sites within a unified and standardized framework.

With a budget of ?400 million, a contribution of ?190 million of the European Union and the participation of 20 institutions from 11 European countries (**Austria, Belgium, Finland, France, Ireland, Italy, Poland, Portugal, Spain, the Netherlands and the United Kingdom**), PIXEurope will master key technology platforms spanning a broad range of materials - from silicon and silicon nitride to indium phosphide, lithium niobate, and beyond - and the integration of photonic and electronic chips.?

Now in its second year of operation, PIXEurope has moved from setup into early delivery More than 100 companies and research and technology organizations have already engage with the Pilot Line through technical discussions and exploratory collaborations, spannin the full PIC value chain. As of May 2026, four of the five planned service lines are alread operational: consultancy, training, prototyping, and participation in collaborative R& projects. From November 2026, users will be able to access existing partner infrastructures with new Pilot Line infrastructures becoming available from May 2027. Full operationa capacity - including Multi-Project Wafer runs and all five service lines - is expected by Ma 2028

The Pilot Line will serve companies of all sizes through a centralized open-access gateway with the ultimate goal of creating a unique and thriving European PIC ecosystem - reducin time-to-market, lowering risks and costs, and transferring technologies with demonstrate maturity to large-volume manufacturers for scalable industrial production. In doing so PIXEurope represents a decisive step toward European technological sovereignty i photonics, bridging the gap between scientific research and industry for the decades ahead

Spain's fingerprint in PIXEurope

Within PIXEurope, **Spain plays a leading role** through a strong national consortium bringing together **five entities from the autonomous communities of Catalonia, Valencia, Madrid, and Galicia**, with expertise covering the full photonic integrated circuit (PIC) value chain. This coordinated national effort reinforces Spain's strategic position within the European pilot line framework and its contribution to advancing photonic integration technologies.

Spain's leadership is anchored in the **coordination of the overall Pilot Line by ICFO**, under the leadership of Principal Investigator **Valerio Pruneri**. In this role, **ICFO** oversees project management, exploitation, and Pilot Line operations, while technically contributing to the areas of design?kit implementation, novel functional materials such as colloidal quantum

dots, hybrid integration, packaging, testing, advanced characterization, and the development of key photonic demonstrators. **UVigo's QOPHI LAB** provides an important technical contribution in areas such as compact modeling, scalable testing methods, and high?volume manufacturing migration strategies, supported by state?of?the?art infrastructure for characterization, testing, packaging, and hybrid integration of photonic devices. **IMB?CNM (CSIC)** contributes its extensive expertise in silicon micro? and nanotechnologies, underpinning both fundamental and applied research, process development, and training in silicon photonics. As for **UPV,** it will contribute, **through UPVfab**, in advancing hybrid photonic integration by leading III?V/SiPh PIC development, design?kit validation, testing methodologies, and the realization of a photonic processor demonstrator linking research with pilot?line manufacturing. Finally, **IMDEA Networks Institute** will lead the development of a demonstrator for a new 1.6 Tbps pluggable concept, expected to reach data speeds required by next-generation networks and AI-driven data centers. It will also develop photonic interfaces for testing, assembling, and packaging.

Spain's total participation in PIXEurope amounts to **~133M?**, combining European funding from **Digital Europe and Horizon Europe** with national contributions. Of this amount, **Spain coordinates ?66 million in national funding**, co?financed by the **Ministry for Digital Transformation and the Civil Service**, with the **regional support of the Government of Catalonia (Generalitat de Catalunya)**.

Together, these national partners ensure PIXEurope delivers an end?to?end, industry?ready photonics ecosystem, accelerating the translation of cutting?edge research into scalable manufacturing, reliable technologies, and competitive industrial applications across Europe.