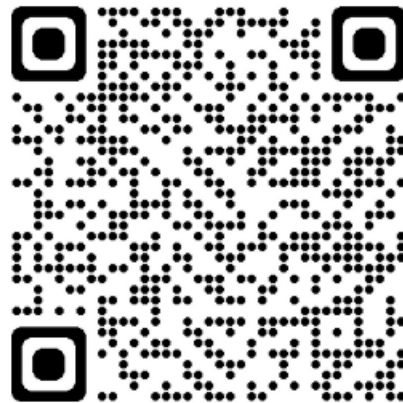


Photonics 4 Security & Defence

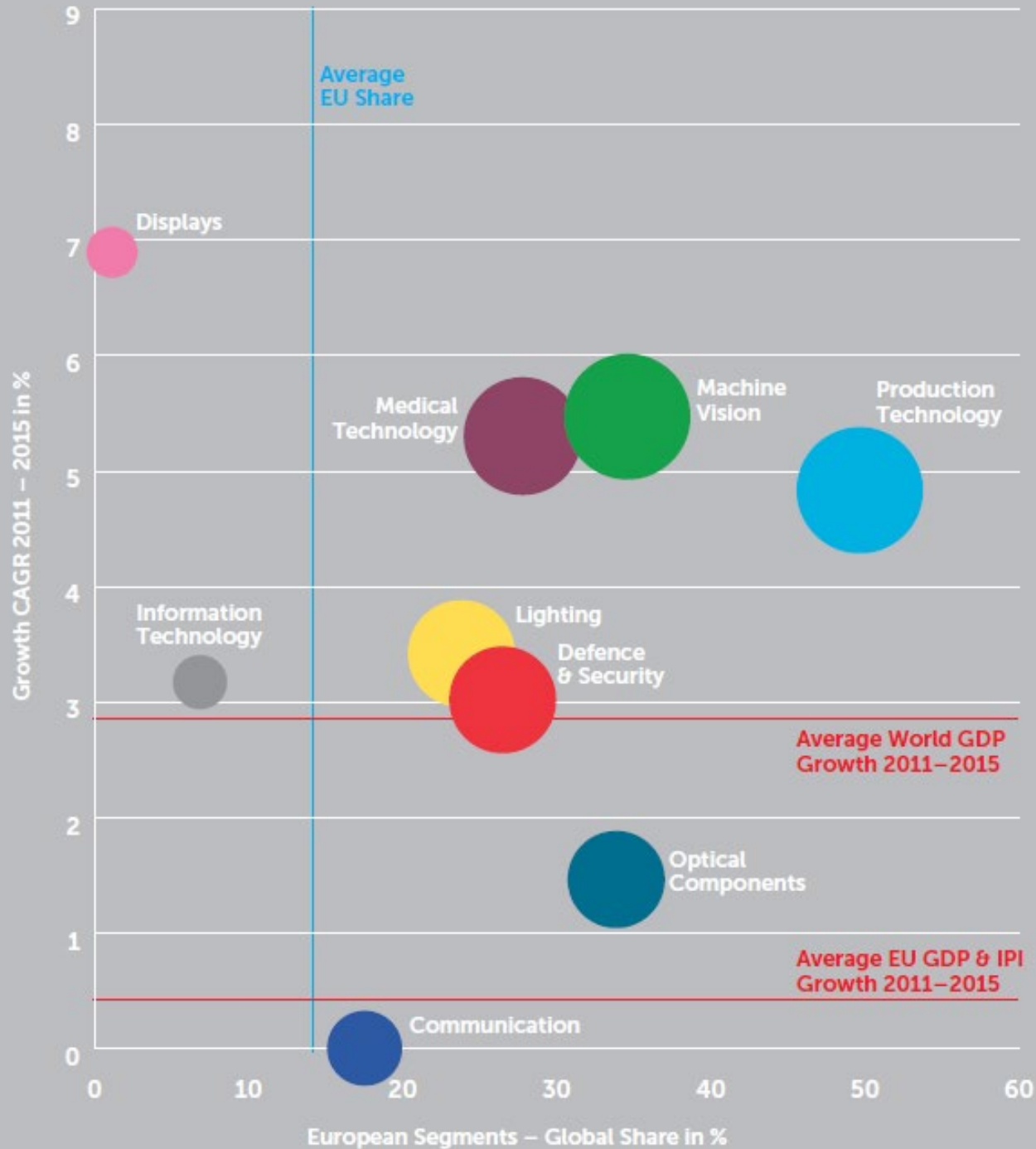
IFEMA 18/05/2023



PHOTONICS²¹



Photonics in the real world



Global market 2016 490B€
Global market 2022 795B€
CAGR 8.4% (!)

EU second largest producer, 300K
people working in photonics in EU

Roughly 3K **new** jobs per year in EU



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What Is the iPhone 14's Photonic Engine?



GAURAV SHUKLA [@gauravshukla](#)

SEP 24, 2022, 11:00 AM EST | 3 MIN READ



Apple

<https://www.howtogeek.com/834842/what-is-apples-photonic-engine/>



Plataforma Española de Fotónica



Fotónica21 is the **Spanish Photonics Technology Platform**, and it brings together the vast majority of companies, research groups and relevant stakeholders in the Spanish photonics R&D community throughout the **entire value chain** of the photonics industry.



Founded in **2007** by
Photonics industry



PHOTONICS PUBLIC PRIVATE PARTNERSHIP



Mirror of the European platform **Photonics21**: 3 Spanish members in its *Board of Stakeholders*.

As an open and participatory forum, it promotes dialogue between science and technology, with the **ultimate goal of fostering the photonics sector sustainable growth at national level**.

Fotónica21 is dedicated to applied research, technical development and practical application of photonic technologies.



270 members



General objective



R&D&I
Spanish agents

Funding agencies

Industrial sectors

General objectives

Help structure the photonics value chain in Spain

Facilitate contact between the ministries and the business sector, facilitating the generation of consortia

Cooperate permanently with all types of entities to solve the scientific-technological challenges of society and respond to sectoral technological demands in the field of Photonics

Collaborate with other European platforms, clusters and Innovation Centers and Hubs to promote the Photonics brand of Spain abroad

Specific objectives 2023-24

SO1. Give visibility to the Strategic Research and Innovation Agenda for photonics in Spain.

SO 2. Promote the explicit inclusion of Photonics in R+D+i Programs at a national and European level.

SO 3. Promote R+D+i and the positioning of the Spanish photonic sector at a national, European and international level, promoting innovation applied to photonic user sectors.

SO4. Promote synergies, carry out activities and events to support the structuring of the community.

Specific objectives 2023-24

SO5. Increase industrial participation in the Platform.

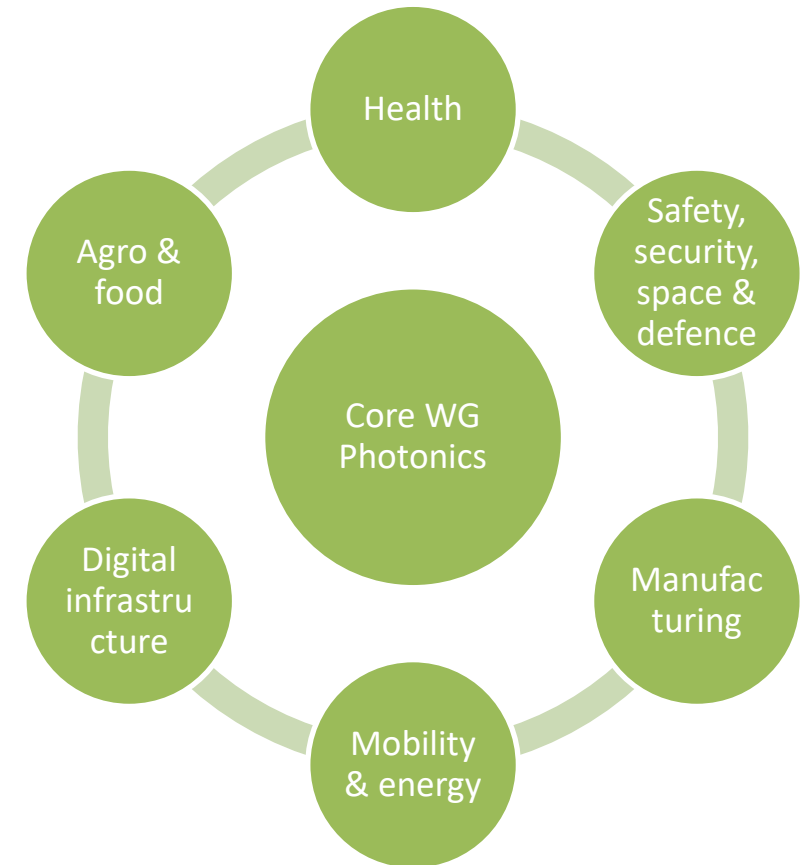
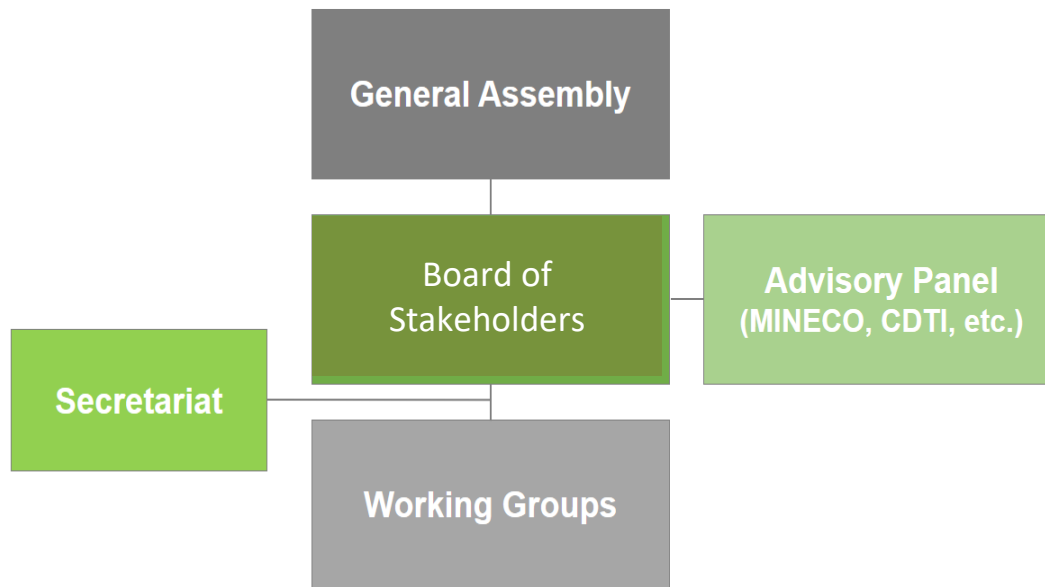
SO6. Increase support for deep tech SMEs and Technology-Based Industry, improve access to finance and investment promotion.

SO7. Support for the promotion of STEM careers to guarantee the availability of professionals in the photonics sector.



Structure

Fotónica21 is structured in **market segments**, plus a **core-photonics segment** embracing research and component development.



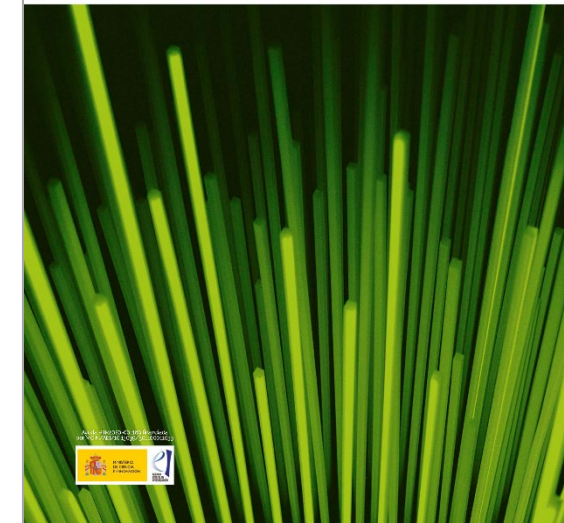


The new Strategic Agenda for Research and Innovation (September 2022)

- In 2019 the Platform is reorganized to adapt to the new Photonics21 Working Groups
- From the Board of Stakeholders it was considered that it was the right time to renew the existing Strategic Agenda, which needed to be reviewed
- Starting from the European Agenda, work was done in each Working Group on its adaptation and extension to the national environment using three large sections
 - Socioeconomic challenges that Photonics must solve
 - Challenges of research and innovation in Photonics
 - Cooperation needs in other fields
- From January to March 2022, virtual meetings were held with **120 national experts** from all sectors, and drafts were circulated, first by the working group, then the entire agenda to the participants, and then to the remaining technological platforms to expand contributions

Agenda estratégica

de Investigación e Innovación
de la Fotónica en España



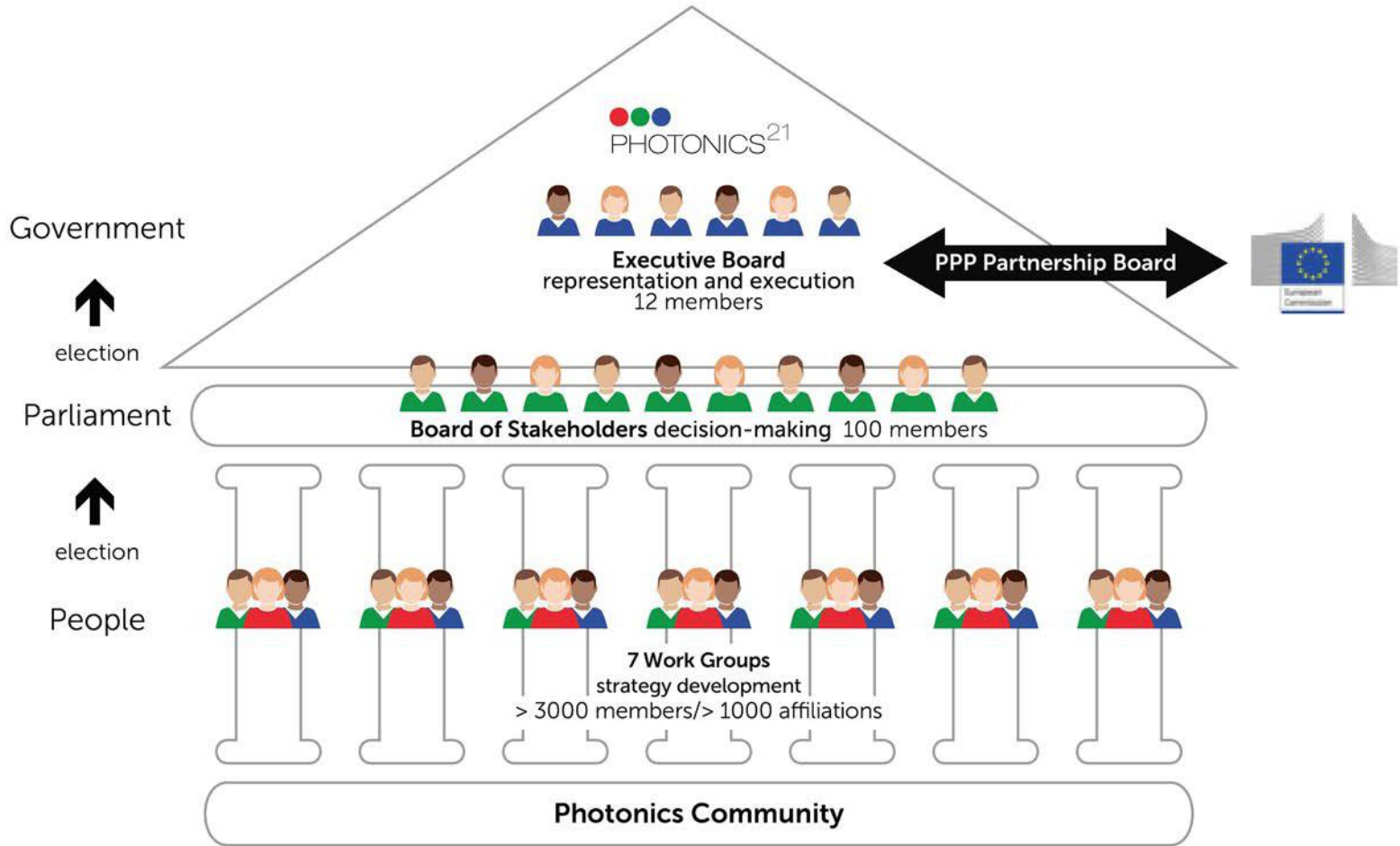
Activities

- Information and topical events
- Interaction with other European Photonics Platforms
- Interaction with clusters as SECPhO and EPIC





Call topics and Horizon Europe funding



Work Group Areas

WG1: Digital Infrastructure

WG2: Manufacturing

WG3: Health

WG4: Climate, Mobility & Energy

WG5: Safety, Security, Space & Defense

WG6: Agriculture & Food

WG7: Core Photonics

Structure Photonics Partnership

Example Visions of topics and contents which in future should be carried out in the Work Groups

Creation with other Programme Areas and Partnerships	<p>Health</p> <ul style="list-style-type: none"> • Cancer • Opto Genetics • Personalized Medicine • Mobile Biosensors & Image Systems • Photonic Drug Testing • Real Time Proteomics, Genomics, Metabolics • Human centric lighting system 	<p>Digital Infrastructure</p> <ul style="list-style-type: none"> • HPC, IoT, 5G • Cyber Security, Secured Communications • Optical networks// Data Intelligence Hubs for AI • Zero downtime in a terabit economy • Photonics Components for Quantum Computing and Cryptography 	<p>Manufacturing</p> <ul style="list-style-type: none"> • Industry 4.0 • Robot cooperation • AI / Machine Learning for flexible production • Quality control and non-destructive testing • Photonics for Circular Economy & Recycling • Materials for photonic production and photon induced material modification 	<p>Safety, Security & Defence</p> <p>Civil Safety & Security</p> <ul style="list-style-type: none"> • Surveillance & Monitoring Systems, • Non destructive observation systems (e.g. in construction) <p>Defence Systems</p> <ul style="list-style-type: none"> • Night Vision, AR, VR, Autonomous Systems – Drones, Robots • Munition Imaging (mines) and Weapon Guiding Systems 	<p>Agro and Food</p> <ul style="list-style-type: none"> • Precious farming for lower fertilizers, herbicides, fungicides • On the fly 100 % quality control along the food processing value chain • Light based enrichment of substances in plants for medical application and food enrichments 	<p>Mobility</p> <ul style="list-style-type: none"> • Autonomous driving systems by sensors, imaging and wireless connectivity • Smart Lighting Systems for enhanced security • Real-time Road (and Track) Track Control and Traffic Monitoring • Smart City / Smart Parking and Traffic Flow Systems • Logistics
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Creation with Photonics Stakeholders	<p>Core Products and Applications</p> <ul style="list-style-type: none"> • Materials for Optical Components & Systems, Production Processes for components, Robots and Human/Robots Cooperation • Materials for Light & Laser Sources, IC, Masks, • Photonic Components and Systems, Lenses, Optical Fibers, PICs, Freeform Optics • Optical Sensors, LIDAR, Spectrometers, High-precision VIS/NIR/MIR/FIR spectroscopy and imagers, Surveillance Systems • LEDs, Nano-LEDs; Human centric lighting system, Low loss LED drivers with sensor functionality and connectivity • Core Tasks • Next Generation Skills Sets: Skill sets & Training - Education and Training • Standards and Regulations
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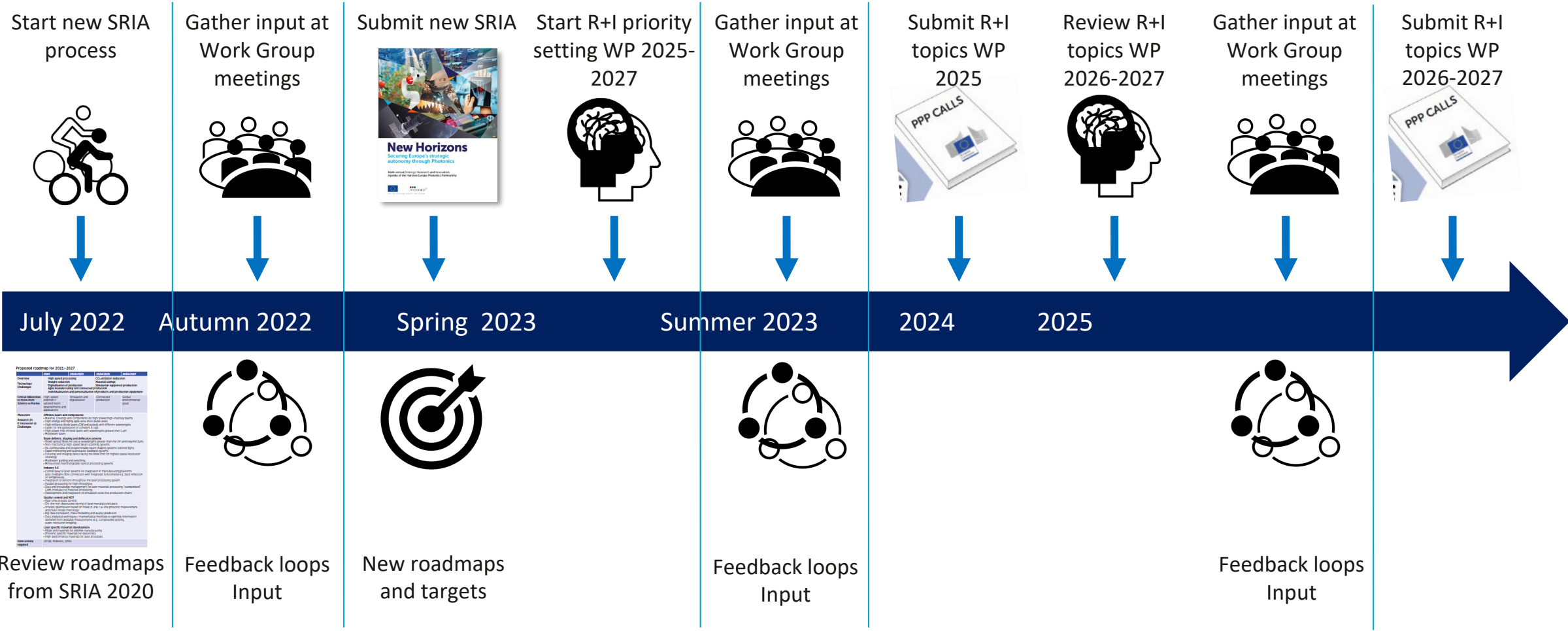
Business and Patents in Photonics

Photonics21 Annual Meeting – New Strategic Research and Innovation Agenda

- Photonics21 Annual Meeting – Bruselas 26 y 27 de abril de 2023.
- Presentación de la nueva agenda: ***New Horizons: Securing Europe's strategic autonomy through Photonics.***




Our journey towards Photonics R+I priorities for the second half of Horizon Europe (2025-2027)





- Advanced materials
- Integrated optics and PICs
- Advanced and Smart sensing
- Design of advanced instrumentation
- Perimetral protection
- System integration and validation
- Combat subsystems
- RPAS and anti RPAS
- Signal processing
- Computer vision
- Artificial intelligence
- ...

Horario	Título	Ponente	Entidad
10:00h	Bienvenida. Fotónica21 y Photonics21.	Santiago Royo, Secretaría Técnica	Fotónica21 
10:15	A Photonics Innovation Hub for Europe: Funding opportunities	Laura Escolano International Project Manager	PhotonHub Europe 
10:30	Intereses y retos en Seguridad y Espacio: Agenda Estratégica de la Fotónica en España	Sonia Pérez Industrial Engineer and Optical Designer.	GREENLIGHT SOLUTIONS <small>GLS</small> Greenlight Solutions <small>Soluciones ópticas y fotónicas</small>
10:50	Radar Fotónico para hacer frente a los nuevos retos de Defensa	Francisco Javier Cruz Hernández I+D Fotónica & Guerra Electrónica Manager	TECNOBIT-OESIA 
11:10	LIDAR de imagen multimodal para guiado autónomo de vehículos y situational awareness	Jordi Riu CEO	BEAMAGINE 
11:30	SMARTLID3, a 3D Imaging Scanning LIDAR for Space In Orbit Servicing Applications	Jesús Aivar BDM & Sales Manager Space Business Unit (SPC)	LIDAX 
11:50	Café		
12:20	Spectral Infrared Radiometry Modelling for Multispectral IR Imaging Performance Optimization	Francisco Cortés CEO.	SENSIA SOLUTIONS 
12:40	Soluciones de Sensado Acustico (DAS) Distribuido para Perímetros y Fronteras: La solución HECTOR de APL.	Francisco López CEO	ARAGON PHOTONICS 
13:00	Diseño y fabricación de sistemas ópticos de precisión para formación de imagen e inspección en defensa y seguridad	Marta de la Fuente Puente CTO	ASE OPTICS 
13:20	Cierre	Santiago Royo, Secretaría Técnica	Fotónica21 
13:30	Fin de la jornada		



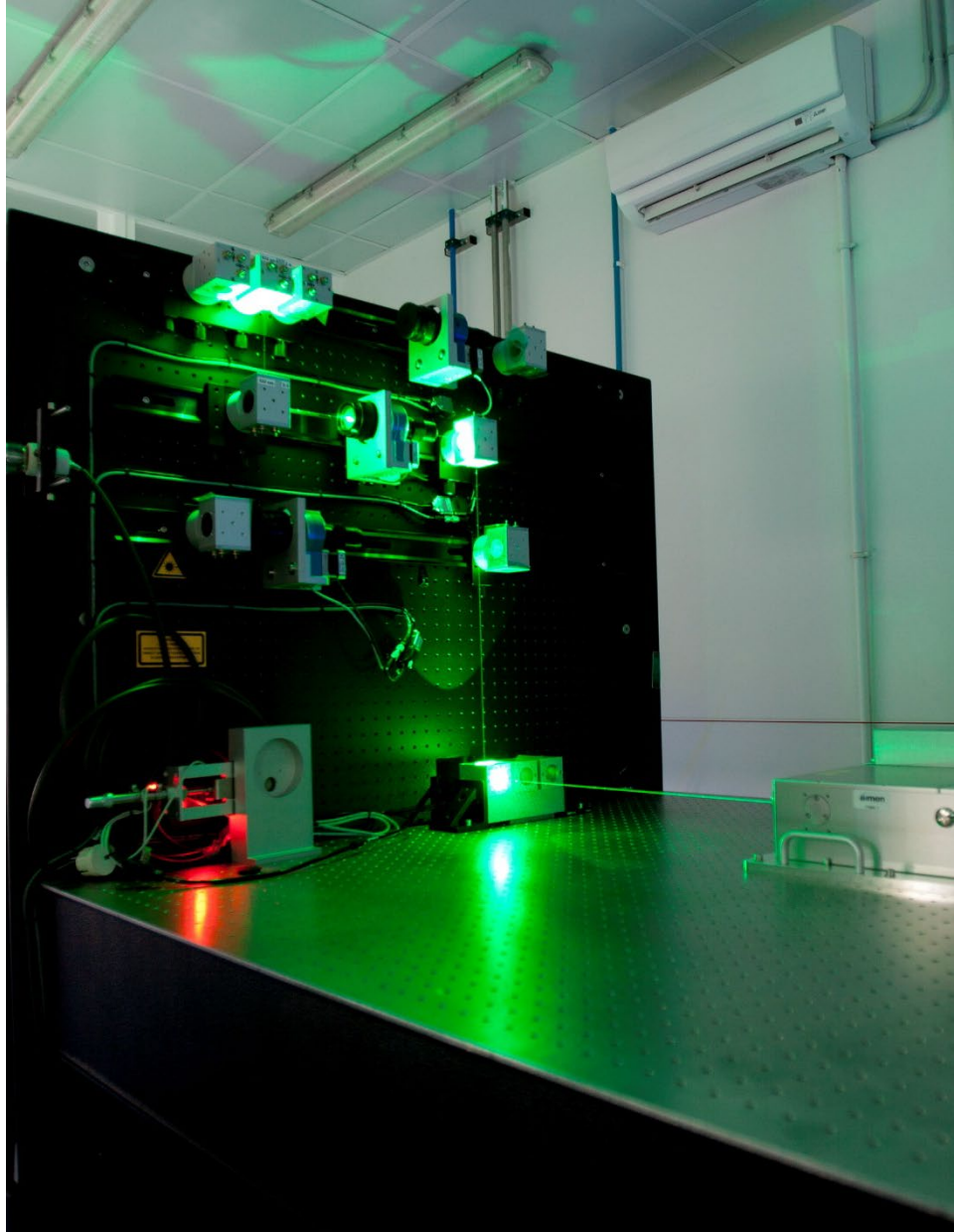
Santiago Royo

Secretaría Técnica Fotónica21

secretaria@fotonica21.org

 [@fotonica_21](https://twitter.com/fotonica_21)

www.fotonica21.org



PHOTONICS PUBLIC PRIVATE PARTNERSHIP





Photonics in Spain, today

Description

- Author Thierry Robin (Tematys)
- Survey from summer 2020 (pandemics) with economic data from 2019 (prepandemics)
- 20 answers from Spanish companies

Main results

- **Size (2019):** 1300 M€ sales
- **Average sales:** 10M€ (Europe 20M€)
- **Jobs:** 5400
- **Average workers per company:** 40 (Europe 80)
- **Main sectors** (15% to 20% of totals)
 - Movilidad (principalmente automoción)
 - Industria 4.0, en particular procesado de imagen y visión por computador
 - Iluminación y energía
 - Salud y bienestar

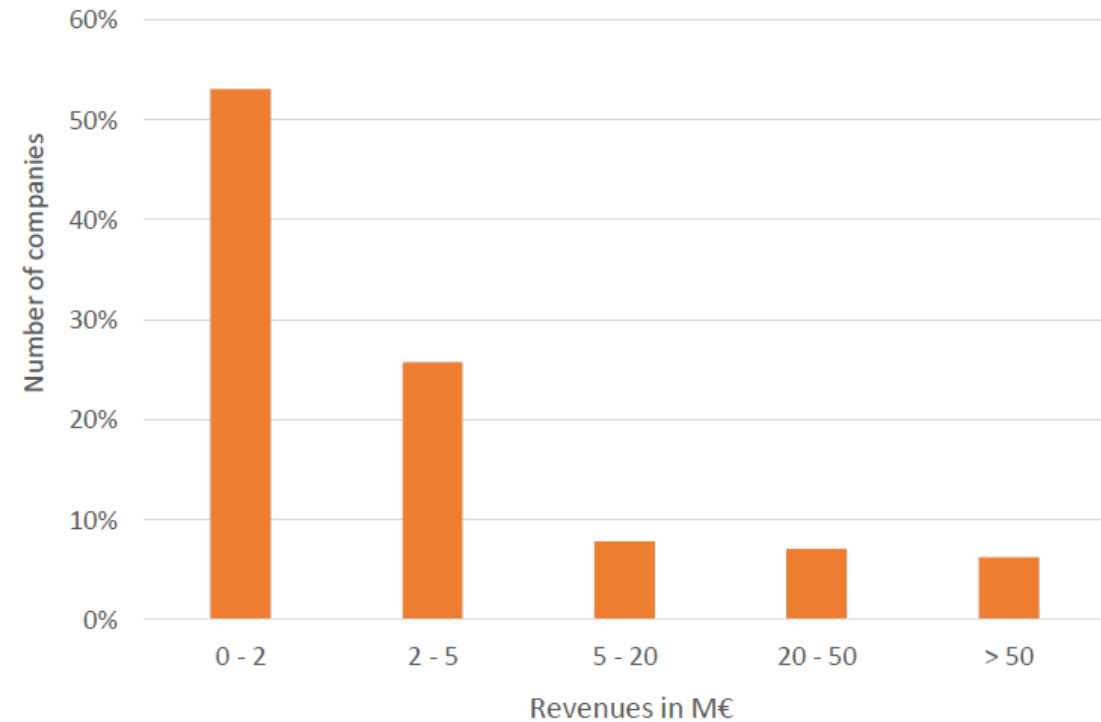
Size of companies

- **Large majority of SMEs and μ SMEs**
 - Observed in the platform

- **Main large companies**
 - Signify Iberia (previously Phillips)
 - Trumpf
 - Olympus Iberia
 - Indra Electro Optics
 - Hella
 - Essilor
 - Hoya Lens Iberia
 - Zeiss Spain



Size distribution of companies in Spain



Resultados más destacados



- **Majority devoted to system, instrumentation, and device development**
- **Growth forecasts in 2020 at 7%, as in the rest of Europe and well above GDP growth**
- **Investment in research, technology and innovation at 14% in SMEs, at EU level**
- **50% of sales in Europe and 50% outside Europe.**
 - Sector fuertemente exportador

Current segmentation of the photonics market

- Push towards final users and applications

