Application driven Photonics components

The focus is on the following themes:

Innovation Actions

Photonics devices to support monitoring therapeutic progress: Actions should develop reliable (high sensitivity, specificity and accuracy), safe to operate, cost-effective and fast photonics enabled devices to support assessing the effects of treatments of major diseases like cancer (excluding skin cancer), infectious, degenerative and cardiovascular diseases, including determining individual dispositions (eg methods to assess drug resistance) and monitoring of therapy progress. The feasibility and validity of the proposed approach should already have been validated in clinical settings. A medical equipment manufacturer should drive the action, and physicians/clinicians/surgeons must be closely involved. Validation should take gender specificities into account. Small scale clinical studies should be included, but clinical trials are excluded.

Sensor-Based Optimization of Production Processes: Sensor-Based Optimization of Production Processes: Actions should address prototyping, demonstration, optimization and validation in real industry settings of highly advanced smart broadband multimodal photonic sensing solutions operating in the spectral range from the ultraviolet to the far infrared, and intended for improving production process through the monitoring of relevant process and product parameters (e.g. physical, chemical, imaging, geometrical and environmental). The focus is on cost-effective process-integrated solutions that are optimized in terms of speed, quality, and resource efficiency. The solutions should also address embedded pre-processing and suitably interpreting the acquired raw data for the optimization of the processes.

The Commission considers that proposals requesting a contribution from the EU between EUR 3 and 6 million would allow these themes to be addressed appropriately. Nevertheless this does not preclude submission and selection of proposals requesting other amounts.

Research and Innovation Actions

Photonics System on Chip/ System in Package for optical interconnect applications: Actions should address advanced techniques for the intimate combination of photonic integrated circuit technology with other enabling circuits, devices and mother boards to realise major advances in the capability, performance and complexity of photonic system-on-chip and system-in-package components targeting photonic interconnect applications in the network, datacentre and consumer communication space. A holistic approach from design through to test is required. The targeted component technologies need to have demonstrable performance advantages in terms of speed, energy efficiency, cost and reliability and fit in the system and network architecture roadmaps of vendors.

Photonics systems for advanced imaging to support diagnostics driven therapy: Actions should research ground-breaking, reliable (high sensitivity, specificity and accuracy), safe to operate, cost-effective and fast photonics enabled imaging system to support diagnostics during intervention and treatments of major diseases like cancer (excluding skin cancer), infectious, degenerative and cardiovascular diseases. Physicians/clinicians/surgeons and a medical equipment manufacturer must be closely involved from requirement specifications to validation in clinical settings. Validation should take gender specificities into account. Clinical trials are excluded.

The Commission considers that proposals requesting a contribution from the EU between EUR 3 and 6 million would allow these themes to be addressed appropriately. Nevertheless this does not preclude submission and selection of proposals requesting other amounts.

Coordination and Support Actions

Fostering careers in photonics: Actions should reach out to STEM graduates/PhD students and young postdocs in order to encourage more of them to pursue a career in photonics. Actions should help make students more industry ready and should provide the appropriate training, encourage innovation and entrepreneurship. Gender issues must also be addressed.

The Commission considers that proposals requesting a contribution from the EU between EUR 1 and 1.5 million (for theme i) would allow this to be addressed appropriately. Nevertheless this does not preclude submission and selection of proposals requesting other amounts.

Photonic technologies for health applications is a very promising field, where the EU has produced significant results during the past decades; however, industrialization is still lagging behind. The challenges are to develop methods that provide the clinicians with photonics enabled tools to improve or to assess the successes of therapies and to transform low TRL technologies into robust medical devices answering to clinician needs.

Photonic circuits are typically employed in combination with high performance electronics, micro-optics while the thermal management and the efficient integration of these technologies is accordingly of major importance. The challenge is to create

and develop advanced techniques for intimate integration of sub-systems incorporating multiple technologies enabling application across multiple domains.

The European continuous process industries as well as the piecewise manufacturing sector are facing the continuous struggle to keep a leading role in the worldwide competition. The challenge is to deploy photonic sensor technologies for the exact monitoring of process and product parameters so as to optimize those processes, saving resources whilst guaranteeing optimum product quality.

Proposals should describe how the proposed work will contribute to the listed corresponding expected impacts and include baseline, targets and metrics to measure impact.

Innovation Actions

i. Strengthened Europe industrial competitiveness in the biophotonics related market.

ii. Increased competitiveness of the European production industry and significant contribution to the digitization of European industry.

Research and Innovation Actions

i. European industrial leadership in photonic systems integration and photonic interconnect technologies and applications, enabling the penetration of high-value markets.

ii. Increased European competiveness in the biophotonic areas and more effective medical interventions and treatments.

Coordination and Support Actions

i. More and better prepared professionals in the photonics sector.

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