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Editorial

Microelectronics and Photonics are two of the key enabling technologies for the markets of the 21st century. They influence aspect of our lives and are technological drivers for multi-billion industry sectors such as telecommunication, life sciences, information technologies, sensing or industrial production by providing key components and applications.

New applications such as automotive, solid-state lighting or optical interconnects are increasing the role of photonics, but they will be widely used only if cost and performance are adequate to supersede conventional technologies. Severe bottlenecks still exist in photonics, such as alignment and packaging or manufacturing of integrated, low cost light sources.

Nanotechnologies and nanomaterials are emerging domains that can dramatically change the situation in photonics: Nanotechnologies could bring new functions and new fabrication techniques to photonics, whereas new materials could emerge (e.g. glasses or ceramics with nanoparticles, functional polymers, carbon nanotubes) with completely different properties and fabrication technologies. Nanophotonics is a new and exciting field that can revolutionize many aspects of the photonics industry.

The MONA project will try to answer some of the key questions related to the future of Photonics:

- Will nanophotonics use the same equipment and technologies as microelectronics/nanoelectronics ?
- Will a convergence occur between electronics and photonics in terms of materials, wafer dimension, processes (e.g. bulk materials vs heterogeneous integration, InP or GaAs vs Si...).
- If the convergence occurs, how to introduce new materials/processes in CMOS fabrication lines ?
- Is there a need for the development of dedicated manufacturing equipment. Will a technological breakthrough be necessary ?
- As in electronics, will a top-down path be the preferred way for manufacturing or will a bottom-up approach emerge ?

MONA will edit and distribute a Periodic Electronic Newsletter, in order to inform thematic network members or other interested parties in :

- Timing and subject of MONA workshops
- Progress on Market studies and Roadmap
- Information on regional and national photonics / nanomaterials / nanotechnology programmes

We hope this newsletter will be of interest to you.

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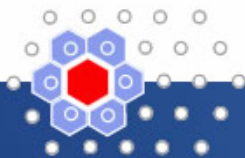
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MONA project Partners

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MONA Press release

The European Commission (EC) has launched a new project within its 6th Framework Programme that will contribute to the coordination of research in photonics and nanotechnologies. The goal of the MONA project (Merging Optics and Nanotechnologies) is to leverage synergies in photonics and nanotechnologies, seeking to increase the impact and efficiency of investment on European research.

The MONA project will coordinate FP-6 R&D programmes with relevant industries, and with regional and national research programmes inside and outside Europe.

Photonics and Nanotechnologies are highly multi-disciplinary fields and two of the principal enabling technologies for the 21st century. They are two of the main technology drivers for wide horizon of industry sectors such as transport, communication, life sciences, manufacturing and information technologies.

There are three principal objectives for the MONA project:

- Create a common site for the exchange of information concerning research, networks of excellence, and integrated projects in photonics and nanotechnologies.
- Promote the timely exchange of scientific results, market development, and technology needs through MONA-developed workshops.
- Develop a European roadmap for photonics and nanotechnologies.

The MONA project will bridge the gap between photonics and nanotechnologies. Photonics/nanophotonics and nanomaterials/nanotechnologies can benefit from each other in terms of new functions, materials, fabrication processes and applications.

As a Specific Support Action, the MONA project will foster collaborations between photonics and nanotechnologies stakeholders and will help preparing future research activities. A major outcome of MONA will be a consolidated scenario (time horizon 5-10 years), setting out development and technology road maps.

MONA Project objectives

MONA will produce tangible results for the benefit of the European Community:

- Economic intelligence and market survey
- Roadmap of technologies / processes / applications / research
- Project joint workshops
- Recommendations for research in Framework Programme-7 [and beyond]
- Dissemination of information
- Tutorials/training from nanotechnology experts to industry
- Dissemination of results of the project to the industrial, R&D and education communities through yearly conferences and the media.

Six European countries and regions are involved in the execution of MONA, under the leadership of the CEA Leti, with input from important industry and research players like Acreo, AIXTRON, Alcatel-Thales, ASMI, the European Photonics Industry Consortium (EPIC), INTEC, Opticsvalley, Schott, the Association of German Engineers (VDI-TZ) and Yole Développement.

The MONA project contributes directly to the development of synergies between photonics/nanophotonics and nanomaterials/nanotechnologies. The challenge of mastering nano-electronics and nano-photonics science and technologies at an industrial scale (i.e. aiming at low cost mass production capability) is of utmost strategic importance for the competitiveness of the European industry in a global context.

Through the cooperative work between equipment manufacturers, nanotechnologies and photonics experts, MONA will help to identify and address the most critical manufacturing issues.

This will ensure the building of a strategic comprehensive approach for the key technologies in order to profit from this highly important area for the European Union.

MONA - Frame of Reference

The goal of this report is to set the starting point of the project MONA regarding its content. The report serves to provide a joint frame of reference for the subsequent work packages. In order to set this frame, we first need descriptions of both optics and nanotechnology. For the purpose of this report we will follow the definition of optics as given in the report "Harnessing Light": "Optics is the field of science and engineering encompassing the physical phenomena and technologies associated with the generation, transmission, manipulation, detection, and utilization of light.

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