Orientation-Patterned Gallium Phosphide for Integrated Nonlinear Photonics

Fact Sheet

Project Information

Pandora
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€ 1 880 000,00

EU contribution
€ 1 880 000,00

Coordinated by
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS
France

Objective

Nonlinear optics is a thriving research field with numerous practical applications in advanced laser sources, all-optical frequency conversion, optical computing, generation of entangled pairs and quantum cryptography, supercontinuum and terahertz-radiation generation. Traditionally reserved to bulk, tabletop optical systems increasing drive in the photonics community to scale these applications to fit on a chip. The main bottleneck in the convergence of nonlinear optics and integrated photonics is that the volume of nonlinear crystals needs to be reduced by at least a factor 7.

Achieving such a volume reduction requires a major scientific breakthrough. The
PANDORA project tackles this issue with the following combination: (a) a material with a high nonlinear figure of merit -- gallium phosphide (GaP); (b) apply orientation patterning to engineer and exalt the intrinsic nonlinear properties of GaP; (c) shape the resulting crystal -- OP-GaP -- into guiding structures that allow ultimate compactness.

The cornerstone of the project is a recent result obtained by the PI and his team, showing that OP-GaP waveguides have the potential to outperform all existing nonlinear crystals with a form factor compatible with photonic integration. The PANDORA project proposes to build upon this result and draw out the full potential of OP-GaP as a single material platform for integrated nonlinear optics.
Funding Scheme

HORIZON-ERC - HORIZON ERC Grants

Coordinator

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS

Net EU contribution
€ 1 880 000,00

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Region
Ile-de-France > Ile-de-France > Paris

Activity type
Research Organisations

Links
Contact the organisation
Website
Participation in EU R&I programmes
HORIZON collaboration network

Other funding
€ 0,00

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