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Partners

Project details

Grant Agreement Number: 101135749
Project Full Title: INdium PHOsphide-based advanced Monolithically integrated photonic building-blocks at near and mid-InfraRed wavelengths
Project Acronym: INPHOMIR
Topic: HORIZON-CL4-2023-DIGITAL-EMERGING-01-51
Type of action: HORIZON-RIA
Granting authority: European Health and Digital Executive Agency (HADEA)
Start date of the project: 01 December 2023
Duration: 42 months
EU Contribution: 4.999.637,50

Contacts

PROJECT COORDINATOR

Lorenzo Mancini | G.E.M. Elettronica

lorenzo.mancini@gemrad.com

DISSEMINATION MANAGER

Isella Vicini | beWarrant S.r.L.

isella.vicini@bewarrant.be

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INPHOMIR
INdium PHOsphide-based advanced Monolithically integrated photonic building-blocks at near and mid-InfraRed wavelengths

Project & Objectives

The context of the INPHOMIR proposal is the drive to develop complex photonic integrated control-units and devices enabling **innovative EU technologies in the domains of inertial navigation and mid-infrared remote sensing**.

The aim of INPHOMIR project is to provide a competitive and independent European supply chain of **monolithic photonic integrated circuits (PICs)** building-blocks, operating at near and mid-infrared wavelengths, by proposing the **Indium Phosphide platform** as a valid solution for a technological scale-up.
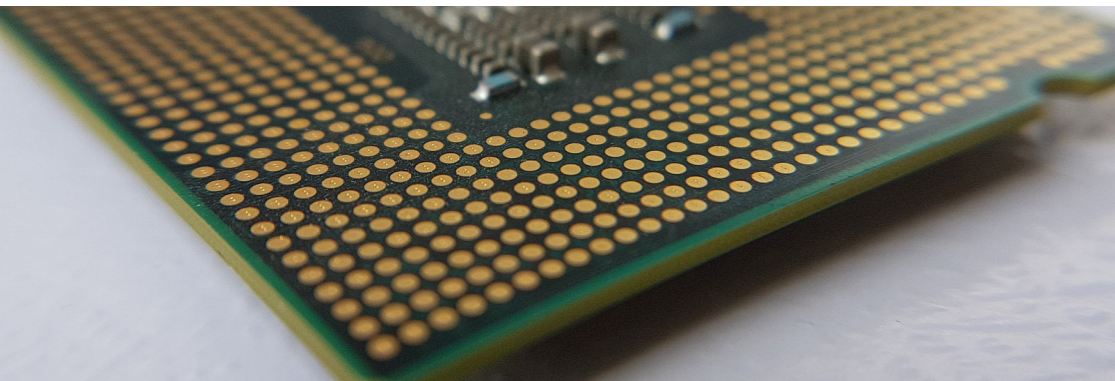
These advanced components will be employed to realise for the **first time an integrated optical gyroscope and a dual-band mid-infrared FMCW lidar**.

These two novel sensors will be put together onto a multi-chip module board to validate a **novel multi-sensorial unit** with unique ranging and inertial sensing capabilities, to be exploited for **aerospace missions of low-earth-orbit nano-satellites and self-driving drones**.

Case Studies

Case Study 1: Multi-Sensorial unit for Autonomus-Navigation

The integration of a lightweight and integrated sensor kit (inertial and Lidar) on SIGMA's drones aims to develop reliable and high-performance autonomous navigation tools. SIGMA's innovative drones include Horus, Helyx-Zero, and Helyx-One. Horus, with a payload capacity of up to 10 kg, is designed for 3D laser reconstructions and autonomous missions using AI-based navigation algorithms. Helyx-Zero, a light and compact 3D-printed drone, is ideal for surveys and precision agriculture.

Case Study 2: Multi-Sensorial Unit for Low-orbit Space-Navigation
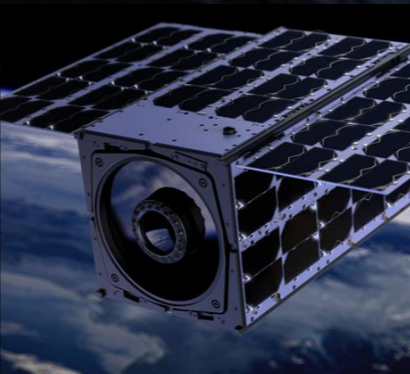
ENDUROSAT AD's platforms are used for multiple earth observation, science and demonstration missions that require high pointing accuracy.

The multi-sensorial unit would provide the required accuracy and give the opportunity for more payloads onboard, improving the capability of our Shared satellite service.

Impacts
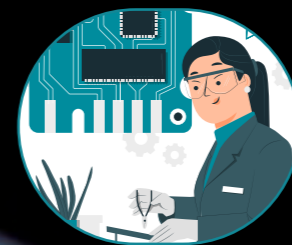
AI technology and sensor data fusion

The INPHOMIR project will help merging AI technology and sensor data fusion. Intelligent data fusion and advanced integrated photonics are brought together for the first time implementing an innovative multisensory module.
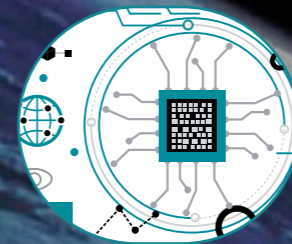
Digitalisation

INPHOMIR's contribution to digitalization lies in its pioneering advancements in PIC-based hardware technology, which promise to revolutionize the supply chain management (SCM) processes of EU companies.

By addressing big-data challenges, particularly through the development of data-fusion and AI algorithms, the project aims to create solutions capable of handling massive flows of data.

Industry 4.0

Industry 4.0 includes various technological applications: within INPHOMIR, we aim to demonstrate compact, low-power-demanding systems and MIR-PIC devices, which can be employed for the interconnection between in-house apparatuses.