PARTNER PRESENTATION AND INTEREST IN HORIZON EUROPE PARTICIPATION

Name of the organisation	**National Institute for R&D in Microtechnologies, IMT Bucharest**
Country	Romania
Type of organisation	Research
Short description	R&D in micro-nanoelectronics, photonics, micro-nano-systems (MEMS, NEMS, MOEMS, RF-MEMS, MNBS), micro and nano-fabrication technologies and new materials
Laboratory/	**Micro and Nano-Photonics Laboratory**
Contact person	Dr. Dana Cristea
E-mail	dana.cristea@imt.ro

Short description of Laboratory

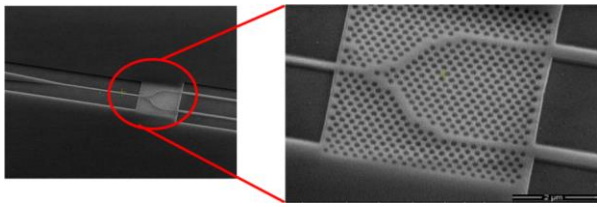
Mission: ***Research, development and education in micro and nanophotonics***
Research domains:

- **Modelling, simulation, CAD and fabrication of micro and nano-photonic structures** (optoelectronic devices and photonic integrated circuits; plasmonics; OMEMS).
- **New materials for micro-nanophotonics** (hybrid nano-composites with controlled optical properties, transparent semiconducting oxides, Graphene, quantum dots) **and new processes and devices.**
- **Micro-nano photonics components** (photodetectors, photonic integrated circuits, metasurfaces, plasmonic structures, DOE, optical components);
- **Organic optoelectronics** (devices based on graphene-polymer nanocomposites)

Applications: ***Optical sensors; Security elements for anti-counterfeit protection and logistic monitoring*** *(holographic labels with extra security nanoelements, RFID elements and temperature sensor);* ***Free space optical communications; Beam shaping; Quantum technologies*****.**

Expertise ***in the specific field of the selected call***

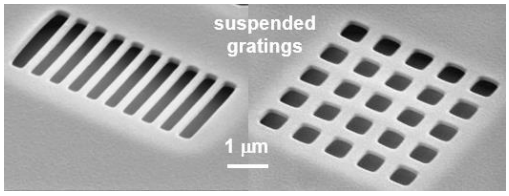
Technologies for Si and SiN based integrated optics:



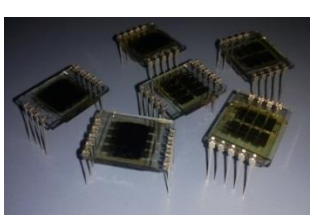
Photonic crystals in polymers

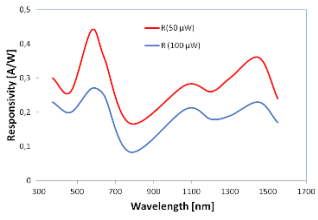
SiON and SU8 waveguides integrated with photodiodes for chemo/biosensors with optical read-out

SOI based devices

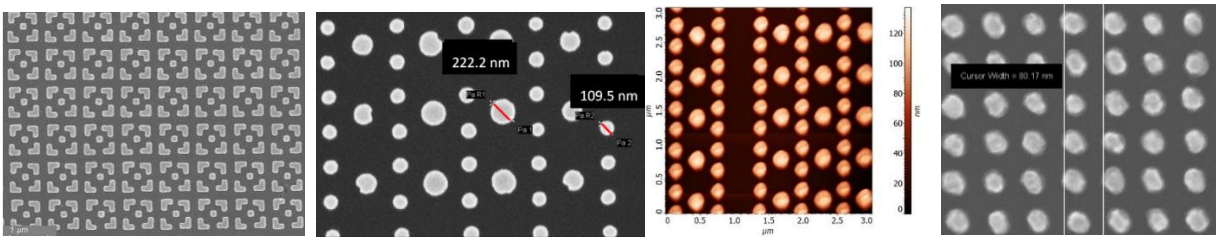


Photodetectors based on nanocomposites
(e.g. PbS QDS:P3HT:PCBM)





Plasmonics:



Plasmonic nanostructures and metasurfaces for sensing aspplications and light shaping

Involved persons. Short CV

PhD. Dana Cristea - PhD in Optoelectronics and Material for Electronics, head of Microphotonics Laboratory; expertise in *design, processing and characterization* of *photonic integrated circuits on different materials (Si, SOI, SiN, polymers), optoelectronic device on Si, quantum dots, 2D materials, plasmonic nanostructures, photonic sensors; coordinator of more than 25 national and international projects* (FP6, FP7, H 2020) in the area of photonic devices and sensors, coordinator of projects for technology transfer to SMEs.

PhD Adrian Dinescu - PhD in in solid state physics, manager of the Electron Beam Lithography and nanoengineering workstation; Expertise in nanoelectronics, nanophotonics, with focus on *structuring at the nanoscale using EBL* and characterization using FE-SEM. Participation in a large number of EU projects (ICT, FET, ERC).

PhD. Catalin Parvulescu - PhD in Electronics and Telecommunications. Expertise in *photolithography processes*, *processing and characterization of photosensitive films, etching, nanoimprint lithography, bonding processes, microfabrication processes for microfluidics*.

PhD Cosmin Obreja- PhD in Organic Chemistry. Expertise in *LPCVD, thermal processes, nanomaterials*.

Interested in the calls and the ***potential contribution*.**

- **HORIZON-CL4-2024-DIGITAL-EMERGING-01-55: Photonics Innovation Factory for Europe (Photonics Partnership) (IA)**

IMT-MINAFAB, www.imt.ro/MINAFAB, is the largest cleanroom in Romania, dedicated to micro and nanofabrication for nanoelectronics, MEMS, NEMS, OMEMS, photonics. It is acknowledged as a national research infrastructure by the Ministry for Research and Innovation since 2017. MINAFAB consists of more than 1.000 m^2 of class 100 - 100.000 cleanroom with a wide range of equipment from photolithographic mask fabrication to etching, deposition and characterization.

Micro and nano fabrication services for photonic devices:

- Mask fabrication
- Oxidation and diffusion for optoelectronics
- Thin film deposition: LPCVD, PECVD, PVD, MBE, ALD
- Patterning technologies: photo and e-beam lithography, NIL; dry etching: RIE, DRIE
- Wafer bonding, Chip dicing, wire bonding
- Reliability tests

Characterization services:

- Optical and scanning electron microscopy
- Scanning probe microscopy- AFM, SNOM
- Ellipsometry, WLY. Spectroscopic methods: Raman, FTIR, UV-Vis, XRD
- Electrical and opto-electrical measurements – from DC up to 110GHz

- **HORIZON-CL4-2023-DIGITAL-EMERGING-01-56: Photonic Strategies and Skills Development (CSA) (Photonics Partnership)**

- Fostering careers in photonics of young researchers

Have you already participated in an EU funded project? If so, provide some references/ results.

- **MIMOMEMS**- European Centre of Excellence in Microwave, Millimetre Wave and Optical Devices, based on Micro-Electro-Mechanical Systems for Advanced Communication Systems and Sensors, REGPOT -Contract no. 202897- ***design, fabrication and characterization of plasmonic nanostructures.***
- **FlexPAET**- Flexible Patterning of Complex Micro Structures using Adaptive Embossing Technology, IP, NMP- algorithms for the optimization ***high volume production of large-area masters micro structured surfaces for diffractive optical elements.***
- **WAPITI** - Waferbonding and active passive integration technology and implementation - STREP FP 6 /IST - ***design and 3D simulation of microring resonator, all-optical wavelength converters, multifunctional devices.***