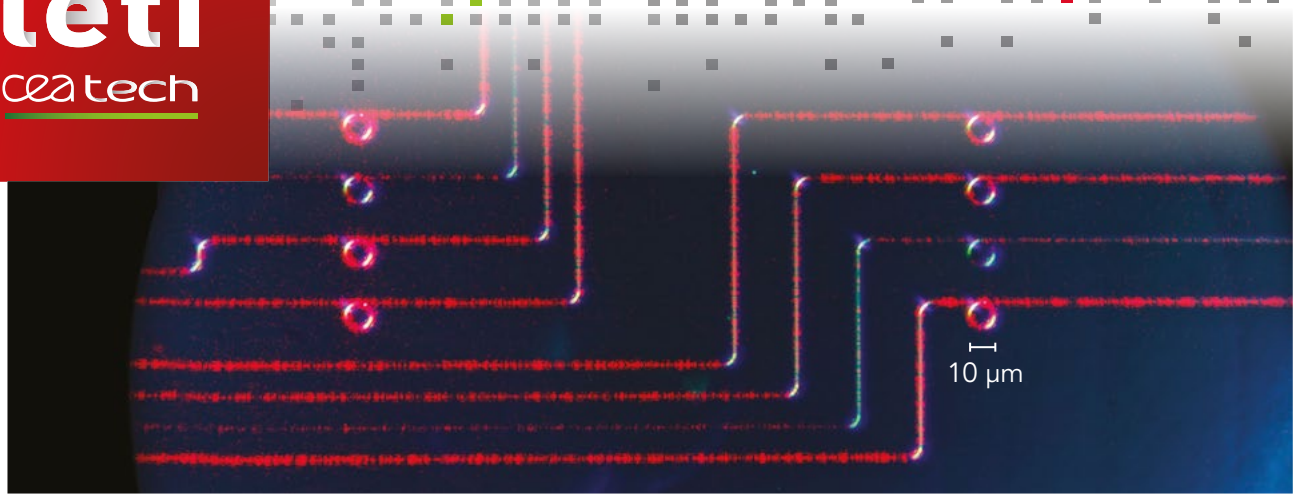


SiN VISIBLE PIC

SILICON NITRIDE PHOTONIC INTEGRATED CIRCUITS (PIC) **FOR BIOPHOTONICS DEVICES**

WHAT ARE SiN VISIBLE PIC?

Leti has developed a SiN photonics platform to address bioanalysis applications leveraging the visible band (λ = 400 to 800 nm). This technology brings to life several optical techniques based on fluorescence, intrinsic fluorescence spectroscopy, Raman spectroscopy and/or simple molecular imprint.

All critical building blocks, including grating couplers, multiplexer/demultiplexers—Array Waveguide Gratings—and micro resonators—ring, photonics crystal array, etc.—are made available to develop sensor cores.

APPLICATIONS

Leti's SiN photonic platform addresses the growing demand for fast, sensitive and simple biophotonic devices that detect pathogens and biomarkers.
The institute offers access to prototyping services of innovative photonic devices.

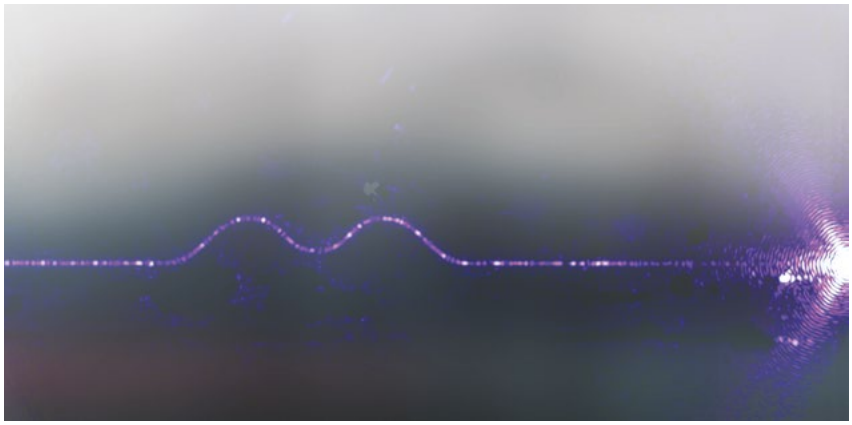
Devices find applications in:

- Healthcare
- Biodefense
- Environmental control—e.g. home diagnostics
- Food quality control
- Agriculture—e.g. plant biology.

Work performed in the frame of the IRT Nanoelec consortium.

WHAT'S NEW?

The biochip cores are micro resonators. Their resonance frequencies are shifted when biomolecules—DNA, protein, cell, virus, etc.—are collected on top of their surfaces. To improve analysis—capture cross-section—a common way consists in using arrays of micro-resonators, individually addressed through a multiplexing circuit.
Leti can also provide fluidics packaging bonded on the photonic chip required to develop full analysis systems.



TOWARDS FAST PLUG AND PLAY ANALYSIS

Leti is currently developing an alternative approach using photonic crystals that are chemically functionalized to make them specifically sensitive to biomarkers. Light is resonantly transmitted when molecules are hybridized on the component surface, and kept reflected otherwise. Biomarker interactions at the surface of the photonic crystals are detected by a camera placed underneath providing grey level images. This approach provides a large capture cross-section, and a fast plug and play analysis.

Beyond biophotonic devices detecting pathogens and biomarkers, SiN photonics circuits can also be used to detect particles of matter, sense gas for air quality analysis, data communications, and much more.

INTERESTED IN THIS TECHNOLOGY?

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