



## PROFIL CNRS TERAHERTZ

Boosted by the optoelectronic approach, Terahertz (THz) technology has reached a degree of maturity such that it is both used for advanced applications (telecommunications, non-destructive testing...) as well as for more academic studies such as condensed matter physics or quantum physics. At the IMEP-LAHC laboratory, researchers of the group PHOTO are involved in the development of both applied and fundamental activities that concern the THz domain. Our results on THz generation, characterization of THz components, or identification and authentication is internationally recognized and the work of the team on methodology and metrology in time-resolved THz spectroscopy have been a reference for 25 years.

The group PHOTO has a unique experimental platform to explore fundamental research topics (pulsed lasers, amplified laser chain, pump-probes experiments) as well as more applied ones (THz spectrometers, THz sources and cameras etc...). It's activities also relies on a network of national and international collaborations and its research is currently funded by several national (ANR, regional contract, PEPR) and international contracts.

In the THz field, the group wishes to intensify its research in two complementary directions:

1. One, more fundamental, concerns the study of new materials (2D materials, large gap semiconductors etc...) and their applications at THz frequencies. The ambition is to take advantage of the properties of these materials for the design of new devices, or innovative functions, for the generation, detection or modulation of THz signals.
2. The second ambition is to introduce a methodological breakthrough in the analysis of THz signals and images by developing methods for processing THz signals and images to extract "low level" information. This transdisciplinary research will rely for example on statistical analysis techniques and/or image processing (fusion, hyper-spectral analysis...). Carried out in an applicative framework (non-destructive testing, identification), it will also feed the more fundamental topics addressed by the team.

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