# MASTER IN PHOTONICS – "PHOTONICS BCN"
# ERASMUS+ "EUROPHOTONICS"

## MASTER THESIS PROPOSAL

**Dates: April - September 2019**

**Laboratory : CommSensLab**
**Institution: UPC**
**City, Country : Barcelona, Spain**

**Title of the master thesis: Measurements in the THz band using time and frequency domain spectrometers**

**Name of the master thesis supervisor: María Santos**
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**Keywords : THz, spectrography**

**Summary of the subject (maximum 1 page) :**

The THz frequency band arises tremendous interest in fields of characterization of materials, security screening, and chemical substances identification. Many components of interest have characteristic finger print resonances into this frequency band, and the properties of the radiation allow to detect hidden objects through paper and clothes, internal defects or cracks, etc.
This master Thesis project will involve the operation of two commercial spectrometers, one into the time and the other into the frequency domain, for obtaining the transmittance spectrum in the THz frequency band. Both instruments rely on THz photoconductive antennas imprinted on GaAs substrates and fed with laser sources: a picosecond pulsed laser in the time domain case, and two continuous wave lasers whose frequencies are offset by the THz frequency in the frequency domain.
For a successful completion of the master Thesis project, the student will have to clearly understand the underlying principles of the THz generation and detection in photoconductive antennas and the differences between each kind of measure: time and frequency, and to be able to correctly process the measured data in each case to connect it to the properties of the samples under test.

**Additional information :**

* Required skills : Due to the complexity of the topic we are looking for highly motivated students with a good academic record.

* Miscellaneous :