



# MASTER IN PHOTONICS – “PHOTONICS BCN” ERASMUS+ “EUROPHOTONICS”

## MASTER THESIS PROPOSAL

**Dates: April - September 2019**

**Laboratory:** Remote Sensing Lab., CommSensLab

**Institution:** Dept. of Signal Theory and Communications, Univ. Politècnica de Catalunya

**City, Country:** Barcelona, Spain

**Title of the master thesis:** Modification of atmospheric aerosol optical properties due to ambient relative humidity

**Name of the master thesis supervisor:** Constantino Muñoz / Maria Jose Granados

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**Keywords:** atmospheric aerosols, optical properties, water uptake, higrscopicity

**Summary of the subject (maximum 1 page):** Atmospheric aerosol particles are a key component of the atmosphere, having an important influence on the Earth’s climate. Under high relative humidity conditions, atmospheric aerosol particles may take up water from the environment increasing their size (hygroscopic growth) and varying their optical and microphysical properties, thus altering their influence on climate. These variations can be measured using remote sensors such as lidar systems. The lidar system in Barcelona can provide measurements of both water vapor and aerosol properties, allowing us to perform hygroscopic growth studies. The project consists in analyzing the existing database of aerosol and water vapor measurements from Barcelona in order to identify the conditions under which aerosol hygroscopic growth occurs. Once identified, the different cases will be analyzed to determine the enhancement on aerosol optical properties with increasing relative humidity conditions depending on the different aerosol types observed in the region.

### **Additional information:**

\* Desirable skills: background in atmospheric sciences and notions of Matlab would be appreciated.

\* Miscellaneous: The UPC closes in August, but the student will have full access to his/her office and should be able to work on his/her own during that month.