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: On the investigation of aerosol characterization using the Nasa Micro-Pulse Lidar Network (MPLNET)

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Keywords: atmospheric aerosols, optical properties, aerosol typing, micro pulse lidar

Summary of the subject (maximum 1 page): Aerosol characterization, also called aerosol typing, provides significant help to understand aerosol sources, their effects, and feedback mechanisms to improve the accuracy of satellite retrievals and to better quantify the effect of aerosols on climate change modelling. Lidar (light detection and ranging) systems are not only capable of identifying multiple layers in the atmosphere but also of classifying aerosols according to their capabilities of performing multi-wavelength and depolarization-sensitive measurements. The Nasa MPLNET is a federated micro-pulse lidar network designed to measure aerosols and clouds. The lidar systems use a one-wavelength laser with the ability to measure the polarization state of the emitted light. The MPLNET systems are co-located with an AERONET (Aerosol Robotic Network) photometer. This project will investigate different approaches for the development of a real-time aerosol mask. The project includes a close collaboration with the Italian Research Council – Institute of Methodologies for Environmental Analysis (CNR-IMAA) which has a long expertise in aerosol characterization and classification using ground-based and spaceborne lidar database.

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.