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## Master in Photonics – “PHOTONICS BCN” ERASMUS+ “EUROPHOTONICS”

### MASTER THESIS PROPOSAL

**Dates: April - September 2020**

**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:** Atmospheric aerosol radiative transfer modelling: development of an efficient tool to speed up aerosol forcing calculations

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**Keywords:** radiative transfer modelling, in-situ, remote sensing, satellite

**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. They have a direct effect on the Earth's climate because of their scattering and absorbing properties. This effect can be estimated by means of radiative transfer models (RTM) parametrized with the aerosol optical, microphysical and radiative properties, and other parameters related to atmospheric gases and the thermodynamic state of the atmosphere. Thus the precise parametrization of RTM starts usually with a long and laborious search of input parameters from different sources (in-situ, remote sensing, satellite).

In this project we propose to develop an interface that will linked the different databases (in-situ, remote sensing) in play, as well as satellite data and the RTM used in the research group. In addition to the quick access to these databases, the data will be reformatted to fit to the expected format of the RTM input data. The aerosol radiative forcing will be evaluated in a few cases to validate the new interface.

### **Additional information:**

\* Desirable skills: background in atmospheric sciences and notions of Matlab/Python/fortran 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.