The COVID-19 virus : an atmospheric aerosol to be urgently characterized.

**Laboratory:** Institut Lumiere Matiere

**Level:** M1

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**Scientific Context:**

The impact of the coronavirus disease of 2019 (COVID-19), caused by the novel coronavirus, is responsible for severe acute respiratory diseases. Early 2020, this virus rapidly spread worldwide, in more 170 countries, including Europe with more than 20 000 deaths only in France. To face such a worldwide crisis, scientists, and especially virologists, quickly improved their knowledge on this new virus. Despite such remarkable findings, several questions remain concerning this emergent virus. Among these issues, one is relative to the safety distance at which the virus is no longer operating.

**Missions:**

The COVID-19 virus is embedded in ambient air and hence belongs to a class of particles called atmospheric aerosols. The research group Atmosphere (ATMOS) at the Institute of Light and Matter (iLM), from Lyon University and CNRS, is studying the optical properties of atmospheric aerosols in time and space. In the framework of this M1-internship, it is proposed to achieve a bibliographical study describing the state-of-the-art knowledge on this emerging virus, where the number of publications is increasing everyday due to emergency. Of special interest will be the question of how this emerging virus will propagate in time and space to identify the underlying physics determining the distance at which people should interfere to prevent the virus to propagate from a person to another. A numerical program can be written to quantify such effect. Also, little is known on its optical properties. The two-months internship will focus on these points and, depending on the evolution of the COVID-19 situation, more specific orientations will be eventually targeted. In all cases, the internship will be a remote internship.

**Outlooks:**

It is clear that this bibliography will be helpful as everyone is concerned by this pandemy.

**Bibliography:**
