

UE Communication et approfondissement thématiques

Sujet : Hawking radiation and rotating black holes in a fluid of light.

Encadrant : Quentin Glorieux, [quentin.glorieux\(at\)lkb.upmc.fr](mailto:quentin.glorieux@lkb.upmc.fr), du LKB, Sorbonne Université.

Descriptif :

Photons are seen as massless particles without interactions and charge.

It is known that confining a photon in a cavity induces an effective mass and coupling it with matter leads to effective interactions.

In such systems, photons will behave as a fluid: a fluid of light.

Interesting properties have been observed in this type of fluid such as superfluidity or the Cerenkov effect.

A novel frontier in this field is to use photon fluid to simulate experimentally gravitational problems in the laboratory.

In this project, you will study the Hawking radiation at the horizon of a black hole and the Penrose mechanism to extract energy from a rotating black hole.