ID contributo: **2** Tipo: **talk**

# Analogue Hawking radiation in a ”flow of light”

*giovedì 26 ottobre 2017 14:55 (25 minuti)*

Propagation of coherent light in a Kerr nonlinear medium can be mapped onto a flow of an equivalent fluid. Such an effective fluid possesses many features which allow us to treat it as a special type of quantum liquid. Here we use this mapping to model the conditions in the vicinity of a black hole horizon. To be more specific, a black hole horizon is modeled by means of a Laguerre-Gauss beam. We describe weak fluctuations of the phase and amplitude of the electric field by wave equations in curved space, with a metric that is similar to the Schwartzschild metric at zero vorticity and to the Kerr metric at a finite vorticity. We find the positions of event horizons and ergoregion boundaries, We also calculate the conditions for the onset of superradiance, which are simultaneously the conditions for a resonance in the analogue Hawking radiation. The resonance strongly enhances the otherwise exponentially weak Hawking radiation at certain frequencies, and makes its experimental observation feasible.

## Summary

We consider a Kerr nonlinear optical system as a playground for modeling black hole horizons and Hawking radiation.

**Autore principale:** Prof. FLEUROV, Victor (School of Physics and Astronomy, Tel Aviv University)

**Relatore:** Prof. FLEUROV, Victor (School of Physics and Astronomy, Tel Aviv University)

**Classifica Sessioni:** Talks on Specific Topics - II