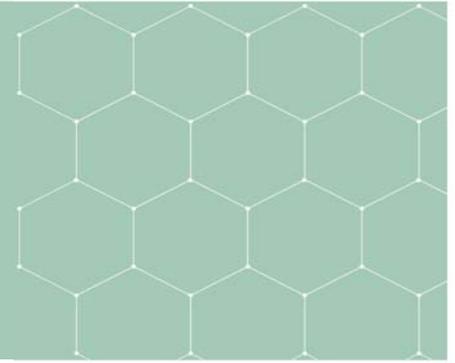




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Quantum Simulation with Light: From Superfluidity to Rotating Black Holes

Quentin Glorieux, Sorbonne University

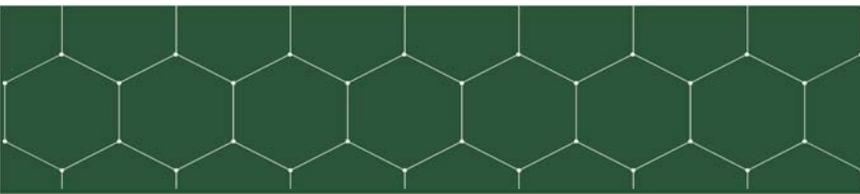
February 14th at 4 p.m.
120 Engineering (Hammond Auditorium)

Abstract

During this presentation I will introduce the basics of hydrodynamics with light in two important systems: exciton-polariton micro-cavities and warm rubidium vapors. Using the analogy between the non-linear Schrodinger equation and the Gross-Pitaevskii equation, I will answer the question about “Can we observe superfluidity with light ?”

I will also discuss recent non-linear and quantum optics experiments through the perspective of hydrodynamics and I will show what are the surprising consequences of this approach.

Finally, I will review recent attempts to observe an analogue of the Hawking radiation and black-hole Penrose super-radiance with table-top experiments.





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Biography:

After his engineering degree at Institut d'Optique and his Master degree at Ecole Polytechnique, Quentin Glorieux went to graduate school at the Paris Diderot University. In 2010, he earned a PhD in Quantum Optics at the laboratory Matériaux et Phénomènes Quantiques under the supervision of Pr Thomas Coudreau. During his PhD, he demonstrated the generation of multispatial mode entangled states using four-wave mixing in hot atomic vapors.

In 2010, he joined Paul Lett's group at NIST in Gaithersburg as a postdoctoral fellow in the Laser Cooling group directed by William Phillips.

Quentin Glorieux was awarded a Marie Curie European IOF fellowship in 2011 to initiate a project on Multimode Quantum Memories with the NIST, the Australian National University and the group of Nicolas Gisin at University of Geneva.

In September 2013, Quentin Glorieux has started a position of Associate Professor at Sorbonne University in Paris as a member of the Laboratoire Kastler Brossel (LKB). He conducts two experimental activities on :

- Nanophotonics : studying the coupling of single-photon emitters to nanostructures such as nanofiber
- Quantum fluid of light : investigating superfluidity of light propagating in atomic media

In 2015, Quentin Glorieux received the City of Paris Young Scientist "Emergences" Award

In 2018, he has been nominated Junior Fellow at the Institut Universitaire de France (IUF) for a duration of 5 years.