

18 months Post-doc position in Fluids of light

at Institut de Physique de Nice (INPHYNI)
UMR 7010, CNRS & Université Côte d'Azur

Photonic quantum fluids have been recently identified as an outstanding system for quantum simulation, ranging from condensed matter to astrophysics [1]. Through the mergence of many-body physics and nonlinear optics, fluids of light reveal quantum hydrodynamic features of light when it propagates in a nonlinear media. One of the most remarkable evidence of light behaving as an interacting fluid is its ability to carry itself as a superfluid. At the Institut de Physique de Nice, we developed a state-of-the-art experimental set-up based on a versatile photonic platform and recently reported a direct experimental detection of the transition to superfluidity (Fig. 1) in the flow of a fluid of light past an obstacle in a bulk nonlinear crystal [2].

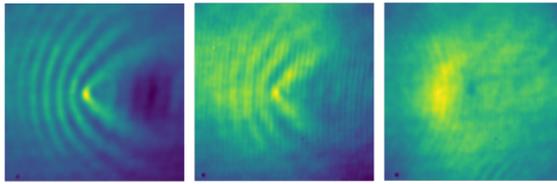


Fig. 1 – Transition from a dissipative (left) to a superfluid (right) regime for a fluid of light propagating in a nonlinear crystal.

We have now few challenging objectives that we want to tackle, including :

- Light superfluidity in complex media
- Quantum turbulence and optical vortices statistics
- Nontrivial nonlinear effects in an optical Josephson junction
- Optical Casimir forces measurements in a fluid of light

This project is part of a EU consortium [Quantum Flagship 2018, Photon for Quantum Simulations (PhoQuS)] providing the opportunity to work with European leading scientists in the field.

Profile.— This **experimental project** is at the interface between quantum hydrodynamics, nonlinear optics and transport in complex media. We are looking for highly motivated applicants with a broad outlook and knowledge in at list one of these topics.

Starting date in May 2019 – Application deadline : March 31, 2019

The net salary is between 2100 and 2450 €/month, depending on experience.

Contact.— We kindly ask the interested applicants to send a CV, research statement, and contact details to the following email addresses :

Claire Michel : claire.michel@inphyni.cnrs.fr

Matthieu Bellec : matthieu.bellec@inphyni.cnrs.fr

[1] I. Carusotto and C. Cuiuti, “Quantum fluids of light”, *Rev. Mod. Phys.* **85**, 299 (2013).

[2] C. Michel et al, “Superfluid motion and drag-force cancellation in a fluid of light”, *Nat. Commun.* **9**, 2108 (2018).