

Master 2 "Systèmes Complexes, Optique, Lasers (SCOL)": Research Training 2022-2023
Master 2 "Matter Molecules and their Environment(MME)": Research Training 2022-2023

Appel à sujet de stage recherche / Call for research training subject

Laboratory: PhLAM

Supervisor: AMO, Alberto

Tél : 03 20 43 46 49, E-mail : alberto.amo-garcia@univ-lille.fr

Collaborator(s):

Topic: Fibre optics, nonlinear optics, topological photonics

Master 2: select the master and the most appropriate option

X Master 2 SCOL	<input type="checkbox"/> Master 2 MME (GP-SCP)
X Option Complex Systems (GP-IKS)	X Option Condensed Matter
	<input type="checkbox"/> Option Condensed Matter/Pharma
	X Option Dilute Matter and Spectroscopy
	<input type="checkbox"/> Option Atmospheric Sciences
	<input type="checkbox"/> Option Modeling at the molecular & atomic scales

Quantum simulation with coupled fibre rings

A quantum simulator is a device of controlled properties in which the physics of a complex system can be simulated. The use of photonic systems to do this has been a major breakthrough in the understanding of complex Hamiltonians such as those related to electronic disorder, quantum phase transitions and topology.

This project aims at experimentally implement a coupled optical fiber system for the study of new topological properties of light. Topology is the study of the properties of a physical system that remain unchanged under smooth deformations. These properties are intimately linked to the symmetries of the system, and can give rise to the appearance of propagation channels whose transmission is robust to disorder. In particular, this system will allow accessing a regime which has hitherto been little explored in which topological properties appear thanks to the temporal modulation of the physical system. The goal of the internship is to explore the topological properties of systems with fractal band structures. It is part of the activities of the ERC EmergenTopo fellowship.

More information on the research group: <http://honeypol.eu/>

Key words: Fibre optics, nonlinear optics, topological photonics