



PhD Studentship in Metz (France), starting October 2024

Robust optical systems analogous to quantum dynamics

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Description:

The quantum population dynamics among discrete coupled quantum levels is formally analogous to various systems in classical optics, such as coupled optical waveguides, frequency conversion in nonlinear optics, or the transformation of the polarization state of light.

Our previous works have shown that these analogies can lead to various broadband and robust photonics systems, with high tolerance to system parameter variations. During this PhD thesis, we will continue these activities by focusing on the analogies with non-reciprocal systems (broken time reversal symmetry) or non-Hermitian systems (open systems with dissipations and/or gain).

In this context, the successful candidate will propose and demonstrate new robust photonic components to control and manipulate light in the framework of guided optics, polarization optics or nonlinear optical frequency conversion.

These studies will include theoretical and numerical modelling, followed by experimental demonstrations for some of the studied systems.

The PhD Studentship is funded by the Université de Lorraine and will be conducted at the LMOPS laboratory in Metz (France). It is part of an established international collaboration with the University of Sofia (Bulgaria).

Experience and skills:

Preferably a master's degree in physics with specialization in optics and photonics. Solid knowledge in optics with focus on guided and nonlinear optics as well as in theoretical physics. Verified experimental skills on the optical bench.

Application:

Applications should be sent by e-mail to germano.montemezzani@univ-lorraine.fr and virginie.coda-bouchot@univ-lorraine.fr. Please include a Curriculum Vitae, a motivation letter, a complete academic transcript and, if already available, a copy of the master's degree diploma or equivalent.