

Open positions: PhD / Postdocs

Topological quantum photonics

*Research group of Philippe St-Jean
MEI research chair in quantum photonics
Department of physics, Université de Montréal*

The discovery of topological phases of matter, which was awarded the 2016 Nobel prize in physics, has profoundly impacted our understanding of condensed matter. Over the last decade, emulating these phases in analog systems, notably photonic platforms, has emerged as a powerful approach for exploring topological physics beyond what is physically reachable in the solid-state. Our young and dynamic research group is interested in extending this emerging field of topological photonics to the quantum realm, either for applications in quantum technologies or to explore the emergence of novel many-body phases. We are doing experimental work whose primary tools involve optical spectroscopy and nanofabrication of photonic structures. However, we also appreciate, from time to time, scratching our head while pondering over more theoretical stuff.

The principal research projects that we are currently developing, and that you could tackle as a PhD candidate or a postdoctoral researcher, include:

1. Strong light-matter coupling in topological systems for the robust generation of non-classical photonic states;
2. Emulating non-conventional topological phases using discrete-time quantum walks with correlated pairs of photons;
3. Optimization of topological photonic structures using advanced computational tools like inverse design and machine learning;
4. Chiral quantum optics with dense ensembles of quantum emitters.

We seek highly talented, curious and motivated researchers that are willing to occupy an active role in our research team. If you are interested, don't hesitate to reach out!

For PhD students: please provide a cover letter, a CV and a copy of recent academic transcripts. (MSc positions are also available.)

For postdoc positions: please provide a cover letter, a CV including a list of publications and 2 potential references.