Abstract

The discovery of topological phases of matter has revolutionized our understanding of condensed matter. Recently, the idea of emulating these phases in synthetic materials, e.g. cold atoms in optical lattices or photons in dielectric nanostructures, has proven to be an extremely powerful approach for exploring topological physics beyond what is physically reachable in the solid-state. This includes the development of new functionalities like topological lasers, but also more fundamental aspects including the discovery of exotic phases involving drive, dissipation, disorder or synthetic dimensions. In this talk, I will present recent works we have realized on a new type of synthetic topological matter involving polaritons, nonhermitian systems and synthetic dimensions