

Titel: Topological phases in non-Hermitian systems

Speaker: Flore Kunst (MPIQ, München)

Abstract:

"While topological phases of matter have mostly been studied for closed, Hermitian systems, a recent shift has been made towards considering these phases in the context of non-Hermitian Hamiltonians, which form a useful approach to describe dissipation. These Hamiltonians feature many exotic properties, which are radically different from their Hermitian counterparts, such as the generic appearance of degeneracies known as exceptional points, the general break down of bulk-boundary correspondence, and the piling up of bulk states at the boundaries known as the skin effect. During my talk, I will address the basic properties of non-Hermitian Hamiltonians, and show how generic exceptional points may appear in one dimension in the presence of symmetries. In addition, I will show that while the Bloch bands of the periodic Hamiltonian fail to provide useful information for certain non-Hermitian systems with open boundary conditions, such models can be accurately quantified by making use of so-called biorthogonal quantum mechanics leading to the concept of biorthogonal bulk-boundary correspondence."