

**Siegfried Beckus - *The connection of the K-theory with the Gap-labeling theorem of Schrödinger operators***

In the mini course, we will give an introduction to the K-theory and its relation to the so called Gap-labelling theorem. The aim of the latter theorem is to find labels of the spectral gaps assigned by the integrated density of states of a self-adjoint operator. This theorem is applied to Schrödinger operators playing an important role in mathematical physics and solid state physics. The presented approach uses the fact that Schrödinger operators arise by  $C^*$ -algebras defined through the underlying dynamics.

The goal of the course is to provide an introduction to the K-theory and explain its connections with the values of the integrated density of states. We will also discuss the concept of  $C^*$ -algebras and their relation with Schrödinger operators. If time admits, we focus at the end on the Fibonacci Schrödinger operator and how the Gap-labelling theorem applies.

For the sake of time, the mini course only aims to draw the connection between this different fields and explain the fundamental objects instead of giving complete proofs. For the more interested participants, references are provided during the course.

The course is designed for participants having basic knowledge on spectral theory of self-adjoint bounded operators, measure theory and group theory.