

Seminar of the Work Group  
Nonlinear Partial Differential Equations  
SS 23

**July 11th, 2023, 14:45 - 15:30**  
**Seminar room: SR 3.068**

## On the continuum limit for discrete Dirac operators on 2D square lattices

Karl Michael Schmidt, Cardiff University

### **Abstract**

The talk discusses the continuum limit of discrete Dirac operators on the two-dimensional square lattice as the mesh size tends to zero. We use the most natural and simplest embedding of the discrete Hilbert space into the continuum Hilbert space, and the question arises naturally when discretising the Dirac operator in two-dimensional Euclidean space, e.g. for numerical analysis. The discrete Dirac operator converges to the continuum Dirac operator in the strong resolvent sense, but not in the norm resolvent sense. The latter result is closely related to the observation that the Liouville theorem does not hold in discrete complex analysis. This is joint work with Tomio Umeda.