



**UNIVERSITÄT  
BIELEFELD**



Faculty of Physics



Faculty of Mathematics

# Colloquium Mathematical Physics

## Felix Flicker

University of Cardiff

### Aperiodic Order in Physics

Typically in physics we make one of two simplifying assumptions: periodicity or randomness. Periodicity underlies diverse fields from lattice QCD to crystals, while randomness appears in models of fluids, chaotic dynamics, and localisation phenomena.

However, beyond these two extremes lies a third type of order: aperiodic. Well known examples include quasicrystals, discovered in 1982. Lacking periodicity, they nevertheless feature sharp diffraction patterns indicative of long-range order. Their physical properties are impossible for crystals in fewer than six dimensions.

Aperiodic order has subsequently come to play an important role across physics, governing exotic and topological states of matter, dynamical systems such as 'time quasicrystals', and even the AdS/CFT correspondence in string theory. I will give a survey of these appearances, and will argue that aperiodic order is just as powerful a simplifying factor as periodicity and randomness.

**Friday, 7 July 2023 16:15 hrs CEST**

**D5-153**