



# Physikalisches Kolloquium

## Prof. Andreas Fring

City University of London

### **PT-symmetry in quantum and nonlinear systems**

I will provide a pedagogical introduction to non-Hermitian quantum systems that are PT-symmetric, i.e., they are left invariant under a simultaneous parity transformation (P) and time-reversal (T). I will explain how generalised versions of this antilinear symmetry can be utilised to explain that these type of systems possess real eigenvalue spectra in parts of their parameter spaces and how to set up a consistent quantum mechanical framework for them that enables a unitary time-evolution. I will also discuss time-dependent versions of these systems. In the second part of the talk I will discuss more recent results on how these general ideas can be used in the context of nonlinear systems. I will discuss how new types of integrable systems can be constructed. I will comment on recent work that establishes the stability of the soliton solutions for these type of systems.

**Monday, May 2, 2022, 4:15 p.m.**

**H6**