Speaker: **Tim Ehret, University of Freiburg**

Title: **Accelerating a Rydberg atom-based Controlled-Z gate via counterdiabatic driving**

Date: **Monday, April 22th, 15 o'clock (s.t.)**

Place: **Seminar room 915**

Title: **Accelerating a Rydberg atom-based Controlled-Z gate via counterdiabatic driving**

Abstract:

Adiabatic Controlled-Z gate protocols are a natural choice for high-fidelity gate realizations due to their great robustness, but their intrinsic slowness diminishes this advantage - this limitation can be overcome by using shortcuts-to-adiabaticity (STA) techniques. A promising Rydberg atom-based CZ protocol was proposed by Saffman et. al. [1]; we built upon their work by identifying a phase issue and applying counterdiabatic driving (CD) to the protocol. The implications of imperfect Rydberg blockade are briefly touched upon in this talk, followed by a discussion of (effective) counterdiabatic driving and the application thereof to the adiabatic CZ protocol. The performance of our accelerated protocol version is illustrated by numerical simulations.

[1] https://doi.org/10.1103/PhysRevA.101.062309