Karlsruher Institut für Technologie

**Fakultät für Physik**

# Physikalisches Kolloquium

**Bernhard Holzer, CERN**

**»The LHeC**
**Study of an ERL based Electron Proton Collider at LHC«**

*Einführung: A.S. Müller*

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The LHeC project studies the design of an option for a future electron-proton collider at CERN that will run in parallel to the standard LHC operation. For this purpose, the existing LHC storage ring will be combined with an Energy Recovery Linac (ERL) for electron acceleration up to a kinetic energy of 50 GeV.
For achieving highest luminosity – $L = 10^{34}\ cm^{-2}\ s^{-1}$ is foreseen for the collider - the design of the electron accelerator is based on ERL technology, where after the interaction point the beam energy is recovered through the same RF structures. While this energy recovery concept is a very promising approach, severe challenges are set by the layout of the interaction region, the beam separation concept and the design of the linac and arc lattice for highest possible momentum acceptance. The control of the emittance and beam-beam effect of both, electron and proton beams is of major importance and has been studied in front-to-end simulations.We will summarise the design principles of the ERL, the optimisation of the arc lattice and the main parameters of the project.

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**Freitag, 07.05.2021, 16:00 Uhr,**
**live über Zoom.**

Karlsruher Institut für Technologie (KIT)
Universitätsbereich • Campus Süd
Fakultät für Physik
76128 Karlsruhe

Telefon (07 21) 6 08 - 435 18
Telefax (07 21) 6 08 - 435 19
E-Mail: fakultaet@physik.kit.edu
www.physik.kit.edu

Besucheradresse:
Wolfgang-Gaede-Straße 1
Physik-Hochhaus, Geb. 30.23
76131 Karlsruhe