



## LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

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Winter Term 2019/2020

# General Theory of Relativity

B. Bahr

### Course Description:

This lecture will provide an introduction to the basics of the theory of general relativity including applications such as black holes and cosmology.

The following topics will be covered:

- recapitulation of the theory of Special Relativity: four-vector formalism, accelerated observers,
- manifolds and curved spaces,
- basics of tensors and differential forms,
- gravitation and Einstein's field equations,
- the Schwarzschild solution and Black Holes,
- cosmology: maximally symmetric spaces and the Friedmann–Robertson–Walker metric,
- gravitational waves.

### Prerequisites:

Knowledge of theoretical physics on the level of a bachelor's degree in physics is strongly recommended. Basic knowledge of special relativity.

### Literature:

will be announced in the lecture

**Date and Place:** Wed, 10:15–11:45, Hörsaal III, Jungiusstr. 9

Fri, 10:15–11:45, Hörsaal III, Jungiusstr. 9

**Problem Classes:** Fri, 12:00–13:30, SR 1, Jungiusstr. 9

and Fri, 14:15–15:45, SR 1, Jungiusstr. 9

Starting on: 25 October 2019

**Starting on:** 16 October 2019

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