



## LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

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Summer Term 2024

# Introduction to general relativity and astrophysical applications

Robi Banerjee

### Course Description:

This is an introductory course to the theory of *General Relativity* where we will focus on the physical basics (e.g., space-time, equivalence principle, curved space and space-time, geodesics) and astrophysical applications (e.g., perihelion drift, black holes, accretion discs, gravitational lensing, gravitational waves).

The course is based on James Hartle's book "GRAVITY: An Introduction to Einstein's General Relativity".

### Prerequisites:

Theoretical mechanics, basics in astronomy and astrophysics.

### Literature:

- James Hartle, *GRAVITY: An Introduction to Einstein's General Relativity* (2003)
- Misner, Thorne & Wheeler, *GRAVITATION* (1973, "the brick")
- Padmanabhan, *Gravitation: Foundations and Frontiers* (2010)
- Bernard Schutz, *A first course in General Relativity* (2009)
- Michele Maggiore, *Gravitational Waves, Volume 1: Theory and Experiment, Volume 2: Astrophysics and Cosmology* (2018)

**Date and Place:** Tue, 10:00–11:30, Blauer Salon, Jungiusstrasse 11  
Wed, 10:15–11:45, Blauer Salon, Jungiusstrasse 11

**Problem Classes:** Tue, 12:00–13:30, Blauer Salon, Jungiusstrasse 11

**Starting on:** 9 April 2024

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