



LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

Summer Term 2023

Theoretical Cosmology and Astroparticle Physics

Geraldine Servant

Course Description:

This lecture will provide an introduction to the basics of high energy astro- and astroparticle physics and cosmology and their theoretical foundations.

The following topics will be covered:

- High Energy Cosmic and Gamma-Rays: Origin and Detection
- Shock Acceleration of High Energy Particles
- Neutrino Astrophysics
- Dark Matter
- Expansion of the Universe
- Thermal Processes in the Early Universe
- Nucleosynthesis
- Matter/ Anti-Matter Asymmetry
- Density Perturbations & Cosmic Microwave Background (CMB)
- Inflation

Prerequisites:

bachelor level knowledge of theoretical physics (classical field theory, basic quantum mechanics and thermodynamics)

Date and Place: Wednesday 11:15-12:45, SR 2, Gebäude 2a, Bahrenfeld
Friday 9:00-10:30, SR 2, Gebäude 2a, Bahrenfeld

Starting on: 5. April 2023
