



Universität Hamburg

DER FORSCHUNG | DER LEHRE | DER BILDUNG

CHAMPP

CENTER IN HAMBURG FOR
ASTRO-, MATHEMATICAL AND
PARTICLE PHYSICS

LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

Summer Term 2022

Theoretical Astroparticle Physics and Cosmology

Günter Sigl

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: Monday 09:15-10:45, SR 2, Gebäude 2a, Bahrenfeld
Thursday 10:15-11:45, SR 2, Gebäude 2a, Bahrenfeld

Starting on: 4.4.2022
