



LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

Winter Term 2022/2023

Introduction to Supersymmetry and Supergravity

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Course Description:

Supersymmetry is a symmetry between bosonic and fermionic degrees of freedom and today a central topics in High Energy Physics. It also has growing applications in Mathematics and other branches of Physics. The lecture course will cover the following topics:

- Supersymmetry algebra and its representation theory,
- Supersymmetric Lagrangians
- Supersymmetric gauge theories theories,
- Extended and higher dimensional supersymmetry,
- Superconformal algebra and its representation theory,
- Non-renormalisation theorems, non-perturbative effects, holomorphy
- Dynamics of $\mathcal{N} = 1$ Supersymmetric gauge theories, holomorphicity, non-renormalization theorems and Seiberg duality
- Dynamics of $\mathcal{N} = 2$ gauge theories and Seiberg–Witten theory
- Supergravity

Prerequisites:

Quantum Field Theory and General Relativity

Date and Place: Mon 16:30–18:00, SR 2, Building 2a, Bahrenfeld
Tue 16:30–17:15, SR 2, Building 2a, Bahrenfeld

Problem Classes: Tue 17:15–18:00, SR 2, Building 2a, Bahrenfeld

Starting on: 24 October 2022
