



LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

Winter Term 2021/2022

Introduction to Supersymmetry and Supergravity

Elli Pomoni

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:

Basic knowledge in General Relativity and Quantum Field Theory

Website of the course:

<https://sites.google.com/view/supersymmetryclass/home>

Date and Place:

Wed 12:30–13:15, Zoom
<https://desy.zoom.us/j/88322413754>
Meeting ID: 883 2241 3754, Passcode: 106223
Thu 12:30–14:00, Zoom
<https://desy.zoom.us/j/86969354417>
Meeting ID: 869 6935 4417, Passcode: 668402

Problem Classes:

Wed 13:15–14:00, Zoom

Starting on:

13 October 2021
