



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

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Winter Term 2023/2024

# Introduction to Supersymmetry and Supergravity

Craig Lawrie, 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:

Quantum Field Theory and General Relativity

<b>Date and Place:</b>	Mon 16:30–18:00, SR 2, Building 2a, Bahrenfeld Tue 16:30–17:15, SR 2, Building 2a, Bahrenfeld
<b>Problem Classes:</b>	Tue 17:15–18:00, SR 2, Building 2a, Bahrenfeld
<b>Starting on:</b>	16 October 2023

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