

- Lecturer:

Prof. Jan Louis
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- Date and Place:

Wed 11.00-12.30Uhr, SR 2, Bldg. 2a, Campus Bahrenfeld
Fr 11.00-12.30Uhr, SR 2, Bldg. 2a, Campus Bahrenfeld

- Credit Points:

Credit Points for this course can be gained by passing a written exam. The exam takes place on Friday, January 31, 11.00-12.30.

- Recomended Textbooks

- [1] P. Binetruy, *Supersymmetry*, Oxford University Press, 2006.
- [2] M. Dine, *Supersymmetry and String Theory*, Cambridge University Press, 2007.
- [3] D. Freedman and A. Van Proeyen, *Supergravity*, Cambridge University Press, 2012.
- [4] S. Weinberg, *The Quantum Theory of Fields, Vol III*, Cambridge University Press, 2000.
- [5] J. Wess and J. Bagger, *Supersymmetry and Supergravity*, Princeton University Press, 1992.

- Outline:

16.10: The Lorentz group and the Supersymmetry Algebra

18.10: Representations of $N = 1$ Supersymmetry and the Chiral Multiplet

23.10: Super Yang-Mills Theories

25.10: Exercise 1

30.10: Superspace

01.11: Quantizations and non-Renormalization Theorems

06.11: The supersymmetric Standard Model

08.11: Spontaneous Supersymmetry Breaking

13.11: Exercise 2

15.11: Soft Supersymmetry Breaking

20.11: The Higgs sector in supersymmetric theories

22.11: Experimental signals of Supersymmetry

27.11: Supersymmetric Grand Unified Theories

29.11: Exercise 3

04.12: $N = 1$ Supergravity

06.12: Coupling of $N = 1$ Supergravity to matter

13.12: Quantum Properties and the Holomorphic Anomaly

18.12: Spontaneous Breaking of local Supersymmetry

20.12: Exercise 4

08.01: Mediation Mechanisms

10.01: N -extended Supersymmetry

15.01: $N = 2$ Supersymmetry and Seiberg-Witten theory

17.01: SQCD and Seiberg-Duality

22.01: Exercise 5

24.01: $N = 2$ Supergravity

31.01: $N = 4, 8$ Supergravity