

Lecture Course: Introduction to String Phenomenology

WS 2014/15

- Lecturer:

Prof. Jan Louis

II. Institut für Theoretische Physik der Universität Hamburg

Luruper Chaussee 149, 22761 Hamburg

Office: Campus Bahrenfeld, Bldg. 2a, Rm 601

Phone: 8998-2261

E-mail: jan.louis@desy.de

home page: www.desy.de/~jlouis/

- Date and Place:

Fr, 11:00 – 12:30, SR 2/2a, Bldg. 2a, Campus Bahrenfeld

supplementary classes are offered biweekly:

Mon, 11:00 – 12:30, SR 2/2a, Bldg. 2a, Campus Bahrenfeld

- Credit Points:

Please contact me at the beginning if you need Credit Points for this course.

- Recommended Textbooks

[1] K. Becker, M. Becker and J. Schwarz, *String Theory and M-Theory*, Cambridge University Press, 2007.

[2] R. Blumenhagen, D. Lüst, S. Theisen, *Basic Concepts of String Theory*, Springer, 2013

[3] M. Dine, *Supersymmetry and String Theory*, Cambridge University Press, 2007.

[4] D. Freedman and A. Van Proeyen, *Supergravity*, Cambridge University Press, 2012.

[5] M. Green, J. Schwarz and E. Witten, *Superstring Theory*, Vol I& II, Cambridge University Press, 1987.

[6] L. Ibanez and A. Uranga, *String Theory and Particle Physics*, Cambridge University Press, 2012.

[7] J. Polchinski, *String Theory*, Vol I& II, Cambridge University Press, 1998.

- Course syllabus (Fr, 11:00 – 12:30):

- 16.10: Introduction to string theory
- 24.10: The low energy effective action of string theory
- 31.10: Calabi-Yau compactifications
- 07.11: Calabi-Yau compactifications of the heterotic string
- 14.11: Supersymmetry breaking and gaugino condensation
- 21.11: D-branes in type II Calabi-Yau compactifications
- 28.11: D-brane effective action and model building and
- 05.12: Flux compactifications
- 12.12: Compactifications on generalized geometries
- 19.12: Dualities in string theory
- 09.01: M-theory
- 16.01: F-theory
- 23.01: String cosmology in the early universe
- 30.01 String cosmology in the late universe

- supplementary classes (Mon, 11:00 – 12:30):

- 20.10: Supersymmetry in arbitrary dimensions
- 03.11: Properties of Calabi-Yau manifolds and mirror symmetry
- 17.11: (Extended) supersymmetry in $d = 4$ and the holomorphic anomaly
- 01.12: Soft supersymmetry breaking in string theory
- 15.12: Anomalies and the Green-Schwarz mechanism
- 12.01: More on M/F-theory
- 26.01: More on cosmology