

Module: Elective Advanced Lectures: Theoretical Physics

Module No.: physics70c

Course:  universität**bonn**

Introduction to the AdS/CFT Correspondence (T)

Course No.: physics7515

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with exercises	English	2+1	5	WT/ST

Requirements for Participation:

Preparation:

Quantum Field Theory, General Relativity

Form of Testing and Examination:

Requirements for the examination (written or oral): successful work with the exercises

Length of Course:

1 semester

Aims of the Course:

The correspondence between string theory on Anti-de-Sitter spacetime and conformal quantum field theory on its boundary represents one of the most active and inspiring research areas of theoretical physics in the last decades. The aim of this course is to review the basic concepts to understand this duality between two a priori very different theories and to study some of its implications and applications.

Contents of the Course:

basics of conformal field theory, supersymmetry and string theory, N=4 Super Yang-Mills theory, statement and selected applications of the AdS/CFT correspondence, integrable structures in planar AdS/CFT

Recommended Literature:

- * Horatio Nastase, Lecture Notes "Introduction to AdS/CFT", <https://arxiv.org/abs/0712.0689> or the book "Introduction to the AdS/CFT Correspondence", Cambridge University Press
- * Makoto Natsuume, "AdS/CFT Duality User Guide", Lect.Notes Phys. 903 (2015) pp.1-294, <https://arxiv.org/abs/1409.3575>
- * Joao Penedones, "TASI lectures on AdS/CFT", <https://arxiv.org/abs/1608.04948>
- * Niklas Beisert et al, "Review of AdS/CFT Integrability: An Overview", Lett.Math.Phys. 99 (2012), <https://arxiv.org/abs/1012.3982>
- * Diego Bombardelli et al, "An integrability primer for the gauge-gravity correspondence", J.Phys.A 49 (2016) 32, <https://arxiv.org/abs/1606.02945>