Particules Élémentaires, Gravitation et Cosmologie
Année 2006-2007
String Theory: basic concepts and applications

Lecture 2: 23 February 2007

The string effective action: symmetries and perturbative expansions

1. Classical and quantum strings

1.1 Classical strings in Nambu-Goto and Polyakov formulations
1.2 Quantization and anomalies in flat spacetime
1.3 BRST quantization and D=26
1.4 Classical and quantum strings in a background
1.5. The string effective action and its two faces

2. QFT-like symmetries

2.1 Symmetries from canonical transformations
2.2 General Covariance
2.3 B-gauge invariance
2.4 The quest for higher symmetries

3. Perturbative expansions of the effective action

3.1 The genus (or string loop) expansion

3.2 The derivative (or α') expansion

3.3 Unsolved questions

4. Stringy symmetries

4.1 T-duality for closed strings

4.2 T-duality in presence of isometries

4.3 T-duality for open strings, D-strings/branes