ICTP DIPLOMA PROGRAMME IN HIGH ENERGY PHYSICS 2013-14

SYLLABUS

Susy Field Theory - {12 Lectures = 18 hours} M. Bertolini

1 Supersymmetry: a bird eyes view
1.1 Whatissupersymmetry?
1.2 Whatissupersymmetryusefulfor?
1.3 Someusefulreferences

2 The supersymmetry algebra
2.1 LorentzandPoincar´egroups
2.2 Spinors and representations of the Lorentz group
2.3 Thesupersymmetryalgebra

3 Representations of the supersymmetry algebra
3.1 Masslesssupermultiplets
3.2 Massivesupermultiplets
3.3 Representationonfields:afirsttry

4 Superspace and superfields
4.1 Superspaceasacose
4.2 Superfieldsasfieldsinsuperspace
4.3 Supersymmetric invariant actions - general philosophy
4.4 Chiralsuperfields
4.5 Real(akavector)superfields

5 Supersymmetric actions: minimal supersymmetry
5.1 N=1Matteractions .
5.2 N=1SuperYang-Mills
5.3 N=1Gauge-matteractions

6 Theories with extended supersymmetry
6.1 N=2supersymmetricactions.
6.2 N=4supersymmetricactions
6.3 Onnon-renormalizationtheorems

7 Supersymmetry breaking
7.1 Vacuainsupersymmetrictheories
7.2 Thegoldstonetheoremandthegoldstino
7.3 F-termbreaking
7.4 Pseudomodulispace:quantumcorrections
7.5 D-termbreaking