Integrability, duality and beyond

Report of Contributions

https://indico.global/e/6151

Contribution ID: **1** Type: **not specified**

Aspects of gauge-strings duality

Monday 3 June 2019 16:30 (1 hour)

We discuss some recent developments in the duality between gauge fields and strings. In particular, focusing on conformal field theories in diverse dimensions and with different amounts of supersymmetry, we comment on their string duals, the calculation of various physical observables and the possibility of finding classical integrability on the dual string wolrdsheet.

Presenter: NUÑEZ, Carlos (Swansea University)

Session Classification: Seminar

Contribution ID: **2** Type: **not specified**

From 1 to N

Wednesday 5 June 2019 12:00 (1 hour)

I shall first review the interpretation of integrable sigma-models as realizations of affine Gaudin models. It will then be explained how to obtain new classical integrable field theories by assembling two affine Gaudin models into a single one. Finally, the application of this method to couple together an arbitrary number of principal chiral model fields on the same Lie group, each with a Wess-Zumino term will be presented.

Presenter: MAGRO, Marc (ENS Lyon)

Session Classification: Seminar

Contribution ID: **3** Type: **not specified**

Integrable deformations of the AdS5 x S5 superstring: resolving some puzzles

Tuesday 4 June 2019 10:30 (1 hour)

Recent explorations of the AdS5 x S5 superstring and its integrable deformations have greatly improved our understanding of integrable string sigma models. However, they have also led to a number of puzzles. In this talk we will focus on two particular deformations, the eta and lambda deformations, and their Poisson-Lie duals. In these models the symmetry algebra is q-deformed. We will review the construction of the deformed models and discuss the latest developments in the resolution of one particular puzzle: when do the deformed backgrounds solve the type IIB supergravity equations of motion. To conclude, we will recall some of the puzzles that remain unanswered.

Presenter: HOARE, Ben (ETH Zurich)

Session Classification: Seminar

Contribution ID: **4** Type: **not specified**

Quantum info from symmetry, geometry and the effective action

Wednesday 5 June 2019 10:30 (1 hour)

A well known gauging procedure allowed for the systematic construction of exact deformations of current algebra theories with large classes of them being integrable. We present a modification of this construction allowing for the determination of the anomalous dimension of arbitrary composite operators in these theories exactly in the deformation couplings. In our approach loop computations are completely avoided.

Presenter: SFETSOS, Kostas (University of Athens)

Session Classification: Seminar

Contribution ID: **5** Type: **not specified**

Exceptional Geometry of supersymmetric AdS vacua and their consistent truncations

Wednesday 5 June 2019 15:00 (1 hour)

I will show how exceptional field theory (ExFT) can be used to construct supersymmetric AdS vacua of 10-/11-d SUGRA and their consistent truncations. I will focus on the class of infinitely-many supersymmetric AdS_7 vacua of massive IIA and AdS_6 vacua of IIB and show how ExFT immediately leads to the "minimal" consistent truncation around these vacua in which only the gravitational supermultiplet is kept. I will also show that there are no consistent truncations with vector multiplets for the AdS_7 vacua with Roman's mass and give precise differential conditions for the AdS_6 vacua of IIB to allow consistent truncations vector multiplets.

Presenter: MALEK, Emanuel (AEI Potsdam)

Session Classification: Seminar

Contribution ID: **6** Type: **not specified**

Yang-Baxter deformations of the AdS3 string as marginal deformations of the WZW-model

Monday 3 June 2019 10:30 (1 hour)

The Yang-Baxter deformations of the (bosonic) AdS3xS3 string will be classified and shown to correspond, via a field redefinition, to marginal current-current deformations of the WZW-model.

Presenter: WULFF, Linus (Masaryk University of Brno)

Session Classification: Seminar

Contribution ID: **7** Type: **not specified**

Double and exceptional field theory

Monday 3 June 2019 15:00 (1 hour)

Presenter: BERMAN, David (Queen Mary University of London)

Session Classification: Seminar

Contribution ID: **8** Type: **not specified**

Exploring the landscape of eta-deformed AdS superstrings

Tuesday 4 June 2019 15:00 (45 minutes)

I will focus on integrable eta deformations of AdS superstrings with the deformation encoded in an operator R satisfying the modified classical Yang-Baxter deformation. Such R-matrices include those of Drinfel'd-Jimbo type, whose action is dictated by the choice of Dynkin diagram and associated Cartan-Weyl basis. Superalgebras admit inequivalent Dynkin diagrams and thus allow for different deformations. Focussing on the AdS2xS2xT6 case, I will present all possible backgrounds and show that only the R-matrix associated with the fermionic Dynkin diagram is unimodular, giving rise to a supergravity background. While this resolves one of the main puzzles of eta-deformed superstrings, others remain including the behavior in the maximal deformation limit. Extending to the bi-Yang-Baxter deformation of the AdS3xS3xT4 superstring I will show how, in this case, the maximal deformation limit can be related to the mirror model.

Presenter: SEIBOLD, Fiona (ETH Zurich)

Session Classification: Seminar

Contribution ID: **9** Type: **not specified**

T-duality equivalences beyond string theory

Tuesday 4 June 2019 15:45 (45 minutes)

It is a known fact that the leading order low-energy effective action of string theory is symmetric under T-duality transformations (Buscher rules), and although these are such that geometric properties of solutions may change substantially they still preserve the Hawking temperature and entropy of black holes. The question naturally arises whether or not this holds when one includes higher-order corrections. In this work we present a two parameter family of actions constructed using DFT techniques which contains the first-order corrected actions of string theories for some values of the parameters, and derive the corrected T-duality rules. Then we show that temperature and entropy of solutions with black hole horizons are preserved under the corrected rules, and this is so even for values of the parameters which do not correspond to effective string theory actions, indicating that T-duality might also provide physical equivalences in cases which do not have a known sigma model.

Presenter: VILAR LÓPEZ, Alejandro (IGFAE (Santiago de Compostela))

Session Classification: Seminar

Contribution ID: **10** Type: **not specified**

Spin-2 excitations in Gaiotto-Maldacena solutions

Tuesday 4 June 2019 17:00 (45 minutes)

In this talk, I will present the results for the computation of the spin-2 excitations for a class of N=2 supersymmetric solutions of type IIA supergravity found by Gaiotto and Maldacena. The mass spectrum of these excitations can be derived by solving a second order partial differential equation. In our work, we consider as specific exampkes the Abelian and non-Abelian T-dual versions of AdS5xS5 and we study the mass spectra. For the modes that do not 'feel' the non-Abelian T-duality transforamtion, we can provide analytical formulas for the masses, while for the rest we can only derive the spectra numerically. The numerical values that correspond to large masses are compared with WKB formulas. We also find a lower bound for the masses.

Presenter: PENÍN ASCARIZ, José Manuel (IGFAE (Santiago de Compostela))

Session Classification: Seminar

Contribution ID: **11** Type: **not specified**

Integrable 2d sigma models: RG flow and deformations

Tuesday 4 June 2019 12:00 (1 hour)

I will discuss some examples of deformations of 2d metrics under RG flow. Based on on-going work with Ben Hoare and Nat Levine.

Presenter: TSEYTLIN, Arkady (Imperial College London)

Session Classification: Seminar

Contribution ID: **12** Type: **not specified**

Integrable deformations and Generalised Dualities

Wednesday 5 June 2019 16:30 (1 hour)

I will outline some recent progress in understanding classes of integrable deformations of strings relevant to e.g. the AdS_5 x Sˆ5 superstring. These so-called eta and lambda-deformations exhibit a rich structure of Poisson-Lie symmetries and corresponding notions of Poisson-Lie and non-Abelian T-duality. I will explain how these symmetries become natural when harnessing the power of generalised geometry. I will outline recent results concerning the open string sector of lambda-deformations and the interplay of integrable D-branes with PL and non-Abelian dualisation.

Presenter: THOMPSON, Dan (Swansea University)

Session Classification: Seminar

Contribution ID: **13** Type: **not specified**

The Many Facets of Poisson-Lie T-duality

Monday 3 June 2019 12:00 (1 hour)

Poisson-Lie T-duality was originally introduced to identify
the dynamics of closed strings probing different target spaces. But nowadays it also has become a crucial ingredient in the construction of integrable, two-dimensional sigma-models. After reviewing this intriguing connection from a worldsheet perspective, I will switch to the target space. There we are going to see that Poisson-Lie T-duality naturally appears in the context of gauged SUGRAs and consistent truncations which help to construct new AdS vacua.

Presenter: HASSLER, Falk (University of Oviedo)

Session Classification: Seminar