SFT@Cloud 2021

Report of Contributions

Introduction

Contribution ID: 1

Type: not specified

Introduction

Monday 20 September 2021 13:45 (15 minutes)

Type II superstring field theory r $\,\cdots\,$

Contribution ID: 2

Type: not specified

Type II superstring field theory revisited

Wednesday 22 September 2021 14:00 (30 minutes)

Presenter: KUNITOMO, Hiroshi

Initial value problem and causalit ...

Contribution ID: 3

Type: not specified

Initial value problem and causality in string-inspired non-local field theory

Wednesday 22 September 2021 16:15 (30 minutes)

We investigate causality in a non-local scalar field theory inspired by open SFT. For purely timedependent configurations, we show that a field redefinition perturbative in a parameter ξ , characterizing the non-locality, can turn the theory into a local two-derivative theory with ξ -dependent potential. We support this claim by 'taming' the unbounded oscillations of the rolling solution of the non-local theory into a standard rolling solution of the field-redefined potential. For general configurations, we demonstrate that it is possible to field redefine the theory into two-derivativein-time theory by breaking manifest Lorentz covariance. We discuss light-cone formulation and dispersion relations.

Presenter: HILMI FIRAT, Atakan

The Disk Partition Function in St $\,\cdots\,$

Contribution ID: 4

Type: not specified

The Disk Partition Function in String Theory

Thursday 23 September 2021 15:45 (30 minutes)

We investigate the disk partition function for the open string. This is a subtle problem because of the presence of a residual gauge group $PSL(2,\mathbb{R})$ on the worldsheet even after fixing the conformal gauge. It naively has infinite volume and leads to a vanishing answer. We use different methods that all demonstrate that $PSL(2,\mathbb{R})$ effectively behaves like a group with finite negative volume in the path integral, which leads to a simple prescription for the computation of the disk partition function. We apply our findings to give a simple rederivation of the D-brane tensions.

Presenter: PAL, Sridip

Open string amplitudes on super \cdots

Contribution ID: 5

Type: not specified

Open string amplitudes on superstring D-instanton background

Wednesday 22 September 2021 15:45 (30 minutes)

In this talk, I will discuss how to compute disk amplitudes of collective modes on a single Dinstanton background in type IIB superstring theory, which requires several interesting ingredients of superstring field theory.

Presenter: CHO, Minjae

Four Applications of SFT

Contribution ID: 6

Type: not specified

Four Applications of SFT

Wednesday 22 September 2021 15:00 (30 minutes)

I will discuss four avenues of applications of string field theory, and open problems thereof: RR flux, time-dependent background, open/closed duality, and D-instantons.

Presenter: YIN, Xi (Harvard University)

Contribution ID: 7

Type: not specified

The Primitive Domain for Analytic Off-shell Correlators in SFT

Wednesday 22 September 2021 17:30 (30 minutes)

The work of de Lacroix, Erbin, and Sen (LES) from 2018 showed that the Feynman loop diagrams (those without any massless internal propagator) in closed superstring field theory are analytic on a domain in complex external momenta variables. We prove an analytic extension of the LES domain to a larger domain, using complex Lorentz transformations and Bochner's tube theorem. Explicit applications of our formula to 2-, 3-, and 4-point functions show that the extension equals the well-known Primitive domain. In the case of 5-point functions, we do the analysis for limited subcases.

Presenter: MAHANTA, Ratul

Closed String Deformations in O $\,\cdots\,$

Contribution ID: 8

Type: not specified

Closed String Deformations in Open String Field Theory

Friday 24 September 2021 14:00 (30 minutes)

I discuss recent results and attempts to understand how open string physics is affected by a change in the closed string background in the context of bosonic and supersymmetric open string field theory. This is based on the recent papers 2103.04919, 2103.04920, 2103.04921, and on new yet unpublished results.

Presenter: MACCAFERRI, Carlo

Conformal defects from open stri ...

Contribution ID: 9

Type: not specified

Conformal defects from open string field theory

Wednesday 22 September 2021 16:45 (30 minutes)

Unlike conformal boundary conditions, conformal defects of Virasoro minimal models lack classification. Alternatively to the defect perturbation theory and the truncated conformal space approach, we can employ open string field theory (OSFT) to explore the space of conformal defects. I will illustrate the method by an analysis of OSFT around the background associated with the (1,2) topological defect in diagonal unitary minimal models. Numerical analysis of OSFT equations of motion leads to an identification of a nice family of solutions, recovering the picture of infrared fixed points due to Kormos, Runkel and Watts. OSFT provides us with numerical estimates of the g-function and other coefficients of the boundary state.

Presenter: BUDZIK, Kasia

Closed string disk amplitudes in t

Contribution ID: 10

Type: not specified

Closed string disk amplitudes in the pure spinor formalism

Thursday 23 September 2021 14:00 (30 minutes)

We describe how to calculate closed string scattering on the disk in the pure spinor approach to string perturbation theory. We exemplify the methods with certain low point functions and compare to the known results of the RNS formalism. Moreover, we discuss some potential applications to the study of higher derivative corrections to D-brane actions.

Presenter: HAACK, Michael

String field theory vertices and h $\,\cdots\,$

Contribution ID: 11

Type: not specified

String field theory vertices and hyperbolic geometry (Lecture 1 of 3)

Monday 20 September 2021 15:15 (1 hour)

String field theory vertices and h $\,\cdots\,$

Contribution ID: 12

Type: not specified

String field theory vertices and hyperbolic geometry (Lecture 2 of 3)

Monday 20 September 2021 16:30 (1 hour)

String field theory vertices and h $\,\cdots\,$

Contribution ID: 13

Type: not specified

String field theory vertices and hyperbolic geometry (Lecture 3 of 3)

Tuesday 21 September 2021 17:10 (1 hour)

L-infinity Algebras, Homotopy T ...

Contribution ID: 14

Type: not specified

L-infinity Algebras, Homotopy Transfer and Field Theory (Lecture 1 of 3)

Monday 20 September 2021 14:00 (1 hour)

I give a self-contained introduction into L-infinity algebras, the formulation of classical field theories in terms of these, and the notion of homotopy transfer. One goal is to make it self-evident that L-infinity structures are the proper algebraic way to encode the data of classical field theories. In other words, any consistent field theory gives rise to an L-infinity algebra. A second goal is to illustrate that homotopy transfer is the algebraic formulation of the field theory procedure to "integrate out" degrees of freedom, which may be auxiliary or physical, pure gauge or not.

L-infinity Algebras, Homotopy T ...

Contribution ID: 15

Type: not specified

L-infinity Algebras, Homotopy Transfer and Field Theory (Lecture 3 of 3)

Tuesday 21 September 2021 15:10 (1 hour)

I give a self-contained introduction into L-infinity algebras, the formulation of classical field theories in terms of these, and the

notion of homotopy transfer. One goal is to make it self-evident that L-infinity structures are the proper algebraic way to encode the data of classical field theories. In other words, any consistent field theory gives rise to an L-infinity algebra. A second goal is to illustrate that homotopy transfer is the algebraic formulation of the field theory procedure to "integrate out" degrees of freedom, which may be auxiliary or physical, pure gauge or not.

L-infinity Algebras, Homotopy T ...

Contribution ID: 16

Type: not specified

L-infinity Algebras, Homotopy Transfer and Field Theory (Lecture 2 of 3)

Tuesday 21 September 2021 14:00 (1 hour)

I give a self-contained introduction into L-infinity algebras, the formulation of classical field theories in terms of these, and the

notion of homotopy transfer. One goal is to make it self-evident that L-infinity structures are the proper algebraic way to encode the data of classical field theories. In other words, any consistent field theory gives rise to an L-infinity algebra. A second goal is to illustrate that homotopy transfer is the algebraic formulation of the field theory procedure to "integrate out" degrees of freedom, which may be auxiliary or physical, pure gauge or not.

Massless RR Sector in Superstring \cdots

Contribution ID: 17

Type: not specified

Massless RR Sector in Superstring Field Theory

Wednesday 22 September 2021 14:30 (30 minutes)

Presenter: SEN, Ashoke (Harish-Chandra Research Institute)

Homotopy Intertwining Solution

Contribution ID: 18

Type: not specified

Homotopy Intertwining Solution

Thursday 23 September 2021 17:30 (30 minutes)

We give a homotopy algebraic generalization of the argument for background independence of Witten's open bosonic string field theory, with the goal of formulating some conjectures about the nonperturbative vacuum structure of closed string field theory.

Presenter: ERLER, Ted

The Field Theory of the "World Line"

Contribution ID: 19

Type: not specified

The Field Theory of the "World Line"

Thursday 23 September 2021 16:45 (30 minutes)

I will describe an attempt to classify classical field theories that arise from (quotients of) graded super Lie algebras, which may, but need not necessarily originate from the BRST quantisation of the world line. The role of the representation space, usually identified with perturbative excitations, is merely to identify a suitable reduction of the algebra or, to define trace on the latter if one seeks an action functional.

Presenter: SACHS, Ivo

Equivariant BV Formalism for Str ...

Contribution ID: 20

Type: not specified

Equivariant BV Formalism for String Worldsheet

Thursday 23 September 2021 16:15 (30 minutes)

Worldsheet diffeomorphisms play a central role in string perturbation theory. In the BV approach to worldsheet theory, we need the measure on the space of Lagrangian submanifolds to be base with respect to diffeomorphisms. We discuss a general construction of such base forms. In particular, we explain that it is equivalent to constructing a representation of some Differential Graded Lie Algebra, which was previously introduced in the context of current algebras and called Dg. This clarifies the procedure of covariant insertion of vertex operators on the string worldsheet.

Presenter: MIKHAILOV, Andrei

From Fields to Strings and Back

Contribution ID: 21

Type: not specified

From Fields to Strings and Back

Thursday 23 September 2021 14:30 (30 minutes)

I will give a broad brush picture of a program to derive gauge-string duality in some generality. The key elements will include the reorganisation of perturbative large N gauge theory Feynman diagrams as localised integrals over closed string moduli space using the Strebel parametrisation of the latter. The general picture will be concretely illustrated by the special "tensionless string" limits of the AdS_3 dual of the free symmetric orbifold CFT and the AdS_5 dual to free N=4 Super Yang-Mills theory. In the latter case, I will describe a recent proposal for a candidate worldsheet description involving ambitwistor fields.

Presenter: GOPAKUMAR, Rajesh (ICTS-TIFR, Bengaluru)

AdS/CFT at all loop orders

Contribution ID: 22

Type: not specified

AdS/CFT at all loop orders

Thursday 23 September 2021 15:00 (30 minutes)

In recent years, the so-called "tensionless" limit of string theory on AdS_3 has been conjectured to be exactly dual to a symmetric product CFT in two dimensions. I review evidence for this correspondence, and demonstrate a method for matching correlation functions at every level in string perturbation theory.

Presenter: KNIGHTON, Bob

Doubled Spacetime, Homotopy A ...

Contribution ID: 23

Type: not specified

Doubled Spacetime, Homotopy Algebras, and Puzzles of String Fields on Tori

Friday 24 September 2021 16:15 (30 minutes)

I will outline the program of obtaining "double field theory" — the theory of massless string modes on a torus background with both momentum and winding — beyond cubic order, using the technology of homotopy algebras. I will also point out and resolve some relevant ambiguities ("cocycle signs") afflicting closed SFT on tori.

Presenter: ARVANITAKIS, Alex

Contribution ID: 24

Type: not specified

EL∞-algebras, Generalized Geometry, and Tensor Hierarchies

Friday 24 September 2021 16:45 (30 minutes)

In this talk, I review the definition and applications of EL ∞ -algebras given in arXiv:2106.00108. EL ∞ -algebras are generalizations of L ∞ -algebras comprising weak Lie ∞ -algebras, and they have a number of applications within extended geometry. In particular, they clarify the higher symmetry structure of generalized tangent bundles and double/exceptional field theory. They also provide the algebraic origin for data needed in the definition of higher gauge theories such as the tensor hierarchy of gauged supergravity. This Lie ∞ -algebraic perspective now provides a clear path towards finite gauge transformations and a global picture of these higher gauge theories.

Presenter: SAEMANN, Christian

BV Formalism and Perturbative A ...

Contribution ID: 25

Type: not specified

BV Formalism and Perturbative Algebraic Quantum Field Theory (cancelled)

Friday 24 September 2021 17:30 (30 minutes)

In this talk I will report on recent results at the intersection of perturbative algebraic quantum filed theory (pAQFT) and the homological approach to perturbative QFT known as the BV formalism. After reviewing the basic notions, I will focus on recent results concerning situations where the given theory has boundary or asymptotic boundary data that have to be taken into account. This can be applied for example to discuss soft modes in QED.

Presenter: REJZNER, Katarzyna

Gauge Invariant Perturbation Th $\,\cdots\,$

Contribution ID: 26

Type: not specified

Gauge Invariant Perturbation Theory via Homotopy Transfer

Friday 24 September 2021 15:45 (30 minutes)

I will discuss how to express perturbation theory in terms of gauge invariant variables to all orders in perturbations, by using homotopy transfer and the homological perturbation lemma. Then I will demonstrate how this method is applied in cosmological perturbation theory.

Presenter: PINTO, Allison F.

Panel discussion on "String Field ...

Contribution ID: 27

Type: not specified

Panel discussion on "String Field Theory beyond string theory"

Friday 24 September 2021 14:30 (1 hour)

The impact of SFT in deciphering string perturbation theory and giving novel insights into certain non-perturbative aspects is widely appreciated. However, the impact of SFT and the techniques it gave rise to has far-reaching applications well beyond stringy physics. For example, open string field theory can be used to gain a new perspective on BCFT. The homotopy algebra and BV formalism, ubiquitous in string field theory, play a prominent role in QFT, leading to several recent new results. Unitarity, Analyticity, Wilsonian action for SFT has also given rise to new insights into QFTs. This panel will discuss the merits of a position that research in SFT has fueled new insights into physics beyond string theory and will continue to do so in the future. It will also be discussed what other similar developments can we expect and in which directions.

Presenters: BERKOVITS, Nathan; OKAWA, Yuji; SCHNABL, Martin; SEN, Ashoke (Harish-Chandra Research Institute)

Q&A (Hohm)

Contribution ID: 28

Type: not specified

Q&A (Hohm)

Monday 20 September 2021 17:45 (30 minutes)

Q&A (Zwiebach)

Contribution ID: 29

Type: not specified

Q&A (Zwiebach)

Monday 20 September 2021 18:15 (30 minutes)

Q&A (Hohm)

Contribution ID: 30

Type: not specified

Q&A (Hohm)

Tuesday 21 September 2021 18:20 (20 minutes)

Q&A (Zwiebach)

Contribution ID: 31

Type: not specified

Q&A (Zwiebach)

Tuesday 21 September 2021 18:40 (20 minutes)

SFT@Cloud 2021 / Report of Contributions

Discussion

Contribution ID: 32

Type: not specified

Discussion

Tuesday 21 September 2021 13:00 (1 hour)

Presenters: ZWIEBACH, Barton (MIT); HOHM, Olaf

Conference Brunch

Contribution ID: 33

Type: not specified

Conference Brunch

Wednesday 22 September 2021 13:00 (1 hour)

We meet for socialization at gathertown. Link to join will be sent to the registered participants by email.

Contribution ID: 34

Type: not specified

Discussion

Wednesday 22 September 2021 18:00 (1 hour)

Contribution ID: 35

Type: not specified

Discussion

Thursday 23 September 2021 13:00 (1 hour)

Contribution ID: 36

Type: not specified

Discussion

Thursday 23 September 2021 18:00 (1 hour)

Contribution ID: 37

Type: not specified

Discussion

Friday 24 September 2021 13:00 (1 hour)

Contribution ID: 38

Type: not specified

Discussion

Friday 24 September 2021 18:00 (1 hour)