Online String and SUGRA seminars bulletin board

Report of Contributions

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

Large charges in QFT

Tuesday, 29 September 2020 15:30 (1 hour)

It has been very recently realized that large charge sectors in QFT's exhibit interesting properties and simplifications. In this talk we will discuss two particular examples, namely the case of N=2 superconformal QCD in d=4 and the case of the Wilson-Fisher fixed point in various dimensions. It turns out that it is possible to find different regimes if the coupling of the theory scales appropriately with the charge, thus finding a variety of interesting behaviors.

Presenter: RODRIGUEZ-GOMEZ, Diego (Universidad de Oviedo and ICTEA)

Session Classification: Torino Strings and SUGRA

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

Conformal Bootstrap in Mellin Space

Thursday, 1 October 2020 14:30 (1 hour)

I will talk about recent progress in analytic approaches to the conformal bootstrap.
I will introduce Mellin space as a convenient tool to perform both perturbative and nonperturbative computations in conformal field theories. I will discuss dispersion relations in Mellin space, the sum rules that they lead to, and applications thereof. These include the Wilson-Fisher model in d=4-eps dimensions and holographic computations.
I will also talk about generalization of these techniques to finite temperatures.

Presenter: ZHIBOEDOV, Alexander (CERN)

Session Classification: Strings web seminars

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

Deconfining class S theories

Tuesday, 20 October 2020 14:30 (1 hour)

Class S theories are a broad and interesting class of N=2 superconformal field theories arising from wrapping the six dimensional (2,0) theory on Riemann surfaces. Most of these theories have no known Lagrangian description. I will present a method (based on brane engineering) that allows to systematically construct N=1 Lagrangians flowing to some of these N=2 theories. As an illustration of the method, I will construct a Lagrangian description for the simplest non- trivial class-S theory, the T3 theory with global symmetry E6, and for some related examples.

Presenter: GARCÍA ETXEBARRIA, Iñaki (Durham University)

Session Classification: Torino Strings and SUGRA

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

The fate of discrete 1-form symmetries in 6d

Tuesday, 6 October 2020 14:30 (1 hour)

Recently introduced generalized global symmetries have been useful in order to understand non-perturbative aspects of quantum field theories in four and lower dimensions. In this talk I will focus on 1-form symmetries of weakly coupled 6d supersymmetric gauge theories coupled to tensor multiplets and their interplay with large gauge transformations for dynamical tensor fields. In a non-trivial background for the global 1-form symmetry, this leads to an ambiguity of the effective field theory partition function. This anomaly is eliminated by the inclusion of BPS strings. However, the non-trivial 1-form background can induce fractional string charges which are not compatible with Dirac quantization, and hence the symmetry is absent. I will describe how the anomalous term serves as a tool to detect whether the discrete 1-form symmetries are realized in explicit examples originating from string compactifications. I will show how this is corroborated by finding that a non-trivial ambiguity is related to states, which are excitations of the 6d BPS strings and explicitly break the global 1-form symmetry. For 6d theories consistently coupled to gravity, this ambiguity of the partition function hints at the presence of a symmetry breaking tower of states. When the ambiguity is absent, the F-theory realization of the theories points to the gauging of the 1-form symmetries.

Presenter: APRUZZI, Fabio (University of Oxford)

Session Classification: Torino Strings and SUGRA

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

Universal black holes in AdS

Thursday, 29 October 2020 14:30 (1 hour)

In this talk I discuss a universal microscopic counting for AdS black holes that arise as solutions of the half-maximal gauged supergravity in four and five dimensions. These solutions can be embedded in all AdS M-theory and type II string backgrounds with sixteen supercharges and provide an infinite set of examples dual to N = 2 and N = 4 conformal field theories in four and three dimensions, respectively.

Presenter: ZAFFARONI, Alberto (MIB)

Session Classification: Strings web seminars

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

Bootstrapping defects and boundaries for the free scalar field

Tuesday, 13 October 2020 14:30 (1 hour)

Is there any room for non-trivial unitary and conformal defects in the theory of a single free massless scalar field? And what about boundaries? We use the free scalar equation of motion and the structure of the bulk-to-defect operator expansion to rule out the existence of such defects in several (co-)dimensions. For boundaries we are led to a non-trivial system of crossing equations that we analyze numerically in four bulk dimensions. We show that large regions of parameter spaces are excluded, but a 'kink'in the numerical bounds obeys all our consistency checks and might be an indication of a new conformal boundary condition.

Presenter: VAN REES, Balt (École Polytechnique)

Session Classification: Torino Strings and SUGRA

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

Type B anomalies (Mis-)Matching

Tuesday, 3 November 2020 14:30 (1 hour)

In this talk we analyse several aspects related to type B conformal anomalies associated with Coulomb branch operators in 4d \mathcal{N}=2 SCFTs. In particular, when the vacuum preserves the conformal symmetry, these anomalies coincide with the two point function coefficients in the Coulomb branch chiral ring. We analyse the behaviour of these anomalies on the Higgs branch, where conformal symmetry is spontaneously broken. We review the argument developed in arXiv 1911.05827 [hep-th] and, following it, we argue that these anomalies are covariantly constant on conformal manifolds. In some cases this can be used to show that the anomalies match in the broken and unbroken phases. Then, in the second part of the talk, we focus on some specific 4d \mathcal{N}=2 SCFTs and we test type B anomaly (Mis-)Matching through an explicit Feynman diagram computation. We finally observe that an implication of Type B anomaly Mismatching is the existence of a second covariantly constant metric on the conformal manifold that imposes restrictions on its holonomy group.

Presenter: PINI, Alessandro (Università di Torino)

Session Classification: Torino Strings and SUGRA

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

Interacting alternatives to Maxwell's equations preserving conformal and duality invariance

Thursday, 26 November 2020 14:30 (1 hour)

The source-free Maxwell's equations are both conformal invariant and invariant under an SO(2) electromagnetic duality group. It is commonly thought that these conditions imply their uniqueness. However, there are two interacting electrodynamics theories with the same field content and all the symmetries of Maxwell's equations. One was found in 1983 by Bialynicki-Birula from a strong-field limit of Born-Infeld theory; it has an enhanced Sl(2;R)-duality invariance. The other, dubbed "ModMax", was found very recently from a weak-field limit of a 'generalized'Born-Infeld theory; it has a dimensionless coupling constant and reduces to Maxwell for zero coupling. This talk will review the main features of both Bialynicki-Birula and ModMax electrodynamics.

Presenter: TOWNSEND, Paul K. (DAMPT - University of Cambridge)

Session Classification: Strings web seminars

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

Quantum extremal islands made easy

Tuesday, 10 November 2020 14:30 (1 hour)

Recent discussions of the information paradox involve rather puzzling regions in spacetime called 'Quantum extremal islands'. We show how these are easily understood from the standard Ryu-Takayanagi formula in the presence of Randall-Sundrum branes in arbitrary dimensions.

Presenter: REYES, Ignacio (Perimeter)

Session Classification: Torino Strings and SUGRA

Contribution ID: **14** Type: **not specified**

2d (super)gravity and exceptional geometry

Tuesday, 17 November 2020 14:30 (1 hour)

Upon torus reduction to two dimensions, (super)gravity theories exhibit an infinite-dimensional group of global symmetries –such as the Geroch group for GR, and E9 for maximal supergravity. These symmetries can be gauged to give rise to more non-trivial dynamics, possibly reflecting flux compactifications on complicated backgrounds. For instance, AdS2 solutions in 2d gauged supergravity may arise from reduction on the compact part of black hole near-horizon geometries. The full structure of these gauged models has so far been elusive and little is known about the flux compactifications leading to them.

I will describe the construction of exceptional field theory for affine Lie algebras, a formalism that promotes the (Geroch/E9) symmetries of 2d (super)gravity to formal invariances of their higher-dimensional parent theories, which greatly simplifies the study of certain classes of flux compactifications and should help us complete the construction of the associated two-dimensional gauged models.

Presenter: INVERSO, Gianluca (Queen Mary University of London)

Session Classification: Torino Strings and SUGRA

Contribution ID: **15** Type: **not specified**

TBA

Tuesday, 15 December 2020 14:30 (1 hour)

Presenter: TOLDO, Chiara (kitp university of california santa barbara)

Session Classification: Torino Strings and SUGRA

Contribution ID: **16** Type: **not specified**

Radiation in conformal field theories

Tuesday, 1 December 2020 14:30 (1 hour)

We overview recent developments in the study of radiation in conformal field theories. We show that in conformal field theories including scalar fields, the radiative energy density is not positive definite, the radiated power is not Lorentz invariant and it depends on the derivative of the acceleration. We then discuss the coupling dependence of radiation, and we present unified results for conformal field theories with extended supersymmetry by introducing a novel technique which allows us to calculate the Wilson loop and the partition function for these theories. The results we obtain are all-order expressions in the ‘t Hooft coupling in the planar limit.

Presenter: MARTÍNEZ MONTOYA, Jairo (Universitat de Barcelona)

Session Classification: Torino Strings and SUGRA

Contribution ID: **17** Type: **not specified**

Random Tensors, from random geometry to conformal field theory

Thursday, 12 November 2020 14:30 (1 hour)

In this talk I will briefly review the theory of Random Tensors. In the limit of large size (large N), random tensors exhibit a new "melonic" limit, simpler than the planar limit of random matrices but richer than the one of random vectors. This "not too complicated but not too trivial" situation is ideal for analytic computations. I will then discuss some applications of random tensors to random geometry and conformal field theory.

Presenter: GURAU, Razvan (Heidelberg University)

Session Classification: Strings web seminars

Contribution ID: **18** Type: **not specified**

Causal symmetry breaking: the EFT of quantum chaos

Thursday, 10 December 2020 14:30 (1 hour)

Quantum chaotic systems are often defined via the assertion that their spectral statistics coincides with, or is well approximated by, random matrix theory. In this talk I will explain how the universal content of random matrix theory emerges as the consequence of a simple symmetry-breaking principle and its associated Goldstone modes. This approach gives a natural way to identify wormhole-like correlations, even for individual theories.
I will also discuss how to extend the Goldstone effective-field-theory approach to study operator correlation functions, and present some thoughts on how to understand causal symmetry breaking in holographic bulk gravity.

Presenter: SONNER, Julian (Université de Genève)

Session Classification: Strings web seminars

Contribution ID: **19** Type: **not specified**

Cobordisms and the Swampland

The Swampland program aims to constrain low-energy physics of quantum gravity in a universal way. Recently, much progress has been made by the application of techniques of corbordism theory, which quantify topology-changing processes and can have a strong impact on low-energy physics. I will focus on two such results: Cobordisms can be used to produce a wide class of new examples of bubbles of nothing, which are universal instabilities of nonsupersymmetric vacua. Secondly, cobordisms also constrain the periodicity of the rank of higher-dimensional N=1 supersymmetric theories. The resulting constraint is so strong that it allows one to achieve string universality: The only observed values of the rank in string compactifications are precisely those allowed by Swampland constraints.

Presenter: MONTERO, Miguel

Session Classification: Padova String Theory Seminars

Contribution ID: **20** Type: **not specified**

TBA

TBA

Presenter: ANGELANTONJ, Carlo

Session Classification: Padova String Theory Seminars

Contribution ID: **21** Type: **not specified**

Asymptotic symmetries of electromagnetism and gravity: a Hamiltonian study

Thursday, 14 January 2021 14:30 (1 hour)

The asymptotic symmetries of gravity and electromagnetism are remarkably rich. The talk will explain the asymptotic structure of these theories in the asymptotically flat case by making central use of the Hamiltonian formalism. In particular, how the relevant infinite-dimensional asymptotic symmetry groups emerge at spatial infinity will be discussed. Extensions to supergravity will be briefly touched upon.

Presenter: MARC, Henneaux (ULB & Collège de France)

Session Classification: Strings web seminars

Contribution ID: **22** Type: **not specified**

A CFT distance conjecture

Thursday, 28 January 2021 14:30 (1 hour)

We formulate a series of conjectures relating the geometry of conformal manifolds to the spectrum of local operators in conformal field theories in d > 2 spacetime dimensions. Our central conjecture is that all theories at infinite distance in the Zamolodchikov metric possess an emergent higher-spin symmetry, generated by an infinite tower of currents whose anomalous dimensions vanish exponentially in the distance. In the holographic context our conjectures are related to the Distance Conjecture in the swampland program. We motivate and illustrate these conjectures by surveying the landscape of superconformal field theories in three and four dimensions.

Presenter: RASTELLI, Leonardo (YITP, Stony Brook)

Session Classification: Strings web seminars

Contribution ID: **23** Type: **not specified**

The black hole eikonal and the information paradox

Thursday, 11 February 2021 14:30 (1 hour)

Presenter: Dr GADDAM, Nava (Utrecht University)

Session Classification: Strings web seminars

Contribution ID: **26** Type: **not specified**

Superconformal Theories from S-fold geometries

Monday, 8 March 2021 15:00 (1 hour)

The term S-folds denotes F-theory compactifications which involve non-trivial S-duality transformations. In this talk I will discuss 4d N=2 preserving S-folds and the worldvolume theories on D3-branes probing them. They consist of two new infinite series of superconformal theories whose distinction lies in the discrete torsion carried by the S-fold and in the difference in the asymptotic holonomy of the gauge bundle on the 7-brane. These models are connected by an interesting web of RG flows and their Higgs branches provide new examples of instanton moduli spaces.

Presenter: Dr GIACOMELLI, Simone (Oxford University)

Session Classification: Tor Vergata String Seminars

Contribution ID: **28** Type: **not specified**

Computing supergravity scattering amplitude from CFT

Monday, 1 March 2021 15:00 (1 hour)

Presenter: Prof. BISSI, Agnese (Uppsala University)

Session Classification: Tor Vergata String Seminars

Contribution ID: **29** Type: **not specified**

Updates on the search for multicenter AdS black holes

Monday, 12 April 2021 15:00 (1 hour)

While multicenter black holes in asymptotically flat space have long been studied, the construction of multi black holes geometries in Anti-de Sitter spacetimes remains so far elusive. In this talk I will discuss recent progress on the search for these solutions. Working in the probe approximation, I will show that there exist stable and metastable black hole bound states in compactifications of M-theory on 7-dimensional Sasaki-Einstein manifolds with Betti multiplets and AdS4 vacua. I will map out their thermodynamic landscape and discuss the relevance of these setups for describing glassy systems via holography. I will finally discuss their supersymmetric limits, in light of recent developments regarding the entropy matching for stationary AdS4 black holes via localization in the dual 3d CFT.

Presenter: Dr TOLDO, Chiara (University of Amsterdam)

Session Classification: Tor Vergata String Seminars

Contribution ID: **30** Type: **not specified**

S-folds, String Junctions, and 4D N=2 SCFTs

Monday, 22 March 2021 15:00 (1 hour)

In this talk I will discuss N=2 SCFTs realised on the worldvolume of D3-branes probing an S-fold plane with 7-branes. I will show how to formulate a projection on string junctions ending on 7-branes that generalises the usual orientifold projection of perturbative string theory to the case of S-fold planes. Using this technique it is possible to read off the flavour symmetry of the SCFT for all possible S-fold planes including the cases with discrete torsion. As a byproduct of this analysis it is possible to understand which representations of the flavour symmetry group are allowed. Finally, I will discuss the computation of central charges of these theories and discuss how to define F-theory in the presence of S-folds with discrete torsion.

Presenter: Dr ZOCCARATO, Gianluca (UPenn)

Session Classification: Tor Vergata String Seminars

Contribution ID: **31** Type: **not specified**

Cobordisms and the Swampland

Monday, 29 March 2021 15:00 (1 hour)

Presenter: Dr MONTERO, Miguel (Harvard University)

Session Classification: Tor Vergata String Seminars

Contribution ID: **32** Type: **not specified**

Hamiltonian truncation in AdS

Monday, 15 March 2021 15:00 (1 hour)

Presenter: Dr MEINERI, Marco (CERN)

Session Classification: Tor Vergata String Seminars

Contribution ID: **33** Type: **not specified**

Discrete and higher-form symmetries in SCFTs from wrapped M5-branes

Monday, 19 April 2021 13:30 (1 hour)

Presenter: Dr BONETTI, Federico (Oxford University)

Session Classification: Tor Vergata String Seminars

Contribution ID: **34** Type: **not specified**

Holography, 1-Form Symmetries and Confinement

Monday, 26 April 2021 13:30 (1 hour)

I will discuss confinement in 4d N = 1 SU(N) Super-Yang Mills (SYM) from holography, focusing on the 1-form symmetry and the holographic realization in terms of the Klebanov-Strassler solution. I will show how from the 5d consistent truncation it is possible to identify the topological couplings that determine the 1-form symmetry (and thus global forms of the gauge group) and its 't Hooft anomalies. One of the topological couplings corresponds to a mixed 0-1-form symmetry anomaly, which describes chiral symmetry breaking in the infrared (IR) vacuum. I will also show how to derive this anomaly from the Maldacena-Nunez solution and Little String Theory realizations of pure SYM. I will then discuss how other couplings in the 5d supergravity description of the IR Klebanov-Strassler solution lead to counterterms realizing a gapped Topological Field Theory (TQFT) in the boundary, which saturates the mixed anomaly.

Presenter: Dr APRUZZI, Fabio (Oxford University)

Session Classification: Tor Vergata String Seminars

Contribution ID: **35** Type: **not specified**

Black holes as engines of discovery

Wednesday, 7 April 2021 15:00 (1 hour)

Presenter: Prof. CARDOSO, Vitor (University of Lisbon)

Session Classification: Tor Vergata String Seminars

Contribution ID: **36** Type: **not specified**

The power of integral forms in supersymmetric field theories

Thursday, 25 February 2021 14:30 (1 hour)

We present the power of a geometric framework for supergravity and supersymmetric theories solely based on differential calculus on supermanifolds. The relevant field theory Lagrangians are expressed by integral forms, ready to be integrated on the full supermanifold and automatically implementing the invariance under super-diffeomorphisms. We show that different superspace formulations of a given theory arise from the same action upon suitable choices of the integral forms. We also show the analogies with algebraic structures in string field theory and several new results.

Presenter: GRASSI, Pietro (Universita' del Piemonte Orientale)

Session Classification: Strings web seminars

Contribution ID: **37** Type: **not specified**

Summing over geometries in string theory

Thursday, 11 March 2021 14:30 (1 hour)

I discuss the question how string theory achieves a sum over bulk geometries with fixed asymptotic boundary conditions. I analyze this problem with the help of the tensionless string on AdS3xS3xT4 (with one unit of NS-NS flux) that was recently understood to be dual to the symmetric orbifold of T4. I argue that large stringy corrections around a fixed background can be interpreted as different semiclassical geometries, thus making a sum over semi-classical geometries superfluous.

Presenter: EBERHARDT, Lorenz (IAS)

Session Classification: Strings web seminars

Contribution ID: **38** Type: **not specified**

Multifield Quintessence Models and the Swampland

Monday, 3 May 2021 13:30 (1 hour)

Multifield models with a curved field space have already been shown to be able to provide viable quintessence models for steep potentials that satisfy swampland bounds. The simplest dynamical systems of this type are obtained by coupling Einstein gravity to two scalar fields with a curved field space. In this talk I will discuss the stability properties of the non-trivial fixed points of this dynamical system for a general functional dependence of the kinetic coupling function and the scalar potential. I will show how non-geodesic trajectories appear with a sharp turning rate in field space, which can give rise to late-time cosmic acceleration with no need for flat potentials. In particular, I will then discuss the properties of the phase diagram of the system and the corresponding time evolution when varying the functional dependence of the kinetic coupling. Interestingly, upon properly tuning the initial conditions of the field values, we find trajectories that can describe the current state of the universe. This could represent a promising avenue to build viable quintessence models out of the swampland if they could be consistently embedded in explicit string constructions.

Presenter: Dr DIBITETTO, Giuseppe (University of Padova)

Session Classification: Tor Vergata String Seminars

Contribution ID: **39** Type: **not specified**

The Gravitino and the Swampland

Monday, 17 May 2021 15:00 (1 hour)

We propose a new swampland conjecture stating that the limit of vanishing gravitino mass corresponds to the massless limit of an infinite tower of states and to the consequent breakdown of the effective field theory. We test our proposal in large classes of models coming from compactification of string theory to four dimensions, where we identify the Kaluza-Klein nature of the tower of states becoming light. We point out a general relation between the gravitino mass and abelian gauge coupling in models with extended supersymmetry, which can survive also in examples with minimal supersymmetry. This allows us to connect our conjecture to other well established swampland conjectures, such as the weak gravity conjecture or the absence of global symmetries in quantum gravity. We discuss phenomenological implications of our conjecture in (quasi-)de Sitter backgrounds and extract a lower bound for the gravitino mass in terms of the Hubble parameter.

Presenter: Dr SCALISI, Marco (Max-Planck-Institute, Munich)

Session Classification: Tor Vergata String Seminars

Contribution ID: **40** Type: **not specified**

Quantum spectral problems and Painlevé equations

Monday, 10 May 2021 15:00 (1 hour)

In the first part of the talk I will review some aspects of the Painlevé/gauge correspondence. In particular I will show how we can construct generic and explicit solutions to such nonlinear ODEs by using the Nekrasov partition function in the (epsilon1+ epsilon2=0) phase of the Omega background (Kiev construction).

In the second part I will show how we can systematically associate a set of quantum systems to such nonlinear ODEs and how their spectral properties are completely determined by the Kiev formula and thus by the (epsilon1+epsilon2=0) phase of the Omega background.

This is based on work in collaboration with M.Bershtein and P. Gavrylenko.

Presenter: Prof. GRASSI, Alba (University of Geneva & CERN)

Session Classification: Tor Vergata String Seminars

Contribution ID: **41** Type: **not specified**

N = 2 AdS4 supergravity on a manifold with boundary and "holographene"

Monday, 24 May 2021 15:00 (1 hour)

I will review the geometric construction of pure supergravity Lagrangians in four dimensions in the presence of a non-trivial spacetime boundary, focusing in particular on the N = 2 AdS4 theory on a manifold with boundary. The latter recently turned out to be related, in the spirit of the holographic correspondence, to a D = 3 super-Chern Simons theory featuring "unconventional local supersymmetry", relevant for the description of graphene-like systems for specific spatial geometries.

Presenter: RAVERA, Lucrezia (TO)

Session Classification: Tor Vergata String Seminars

Contribution ID: **42** Type: **not specified**

Superconformal theories from S-fold geometries

Thursday, 1 April 2021 14:30 (1 hour)

The term S-folds denotes F-theory compactifications which involve non-trivial S-duality transformations. In this talk I will discuss 4d N=2 preserving S-folds and the worldvolume theories on D3-branes probing them. They consist of two new infinite series of superconformal theories whose distinction lies in the discrete torsion carried by the S-fold and in the difference in the asymptotic holonomy of the gauge bundle on the 7-brane. These models are connected by an interesting web of RG flows and their Higgs branches provide new examples of instanton moduli spaces.

Presenter: GIACOMELLI, Simone (University of Oxford)

Session Classification: Torino Strings and SUGRA

Contribution ID: **43** Type: **not specified**

Integrable deformations of superstrings

Thursday, 8 April 2021 14:30 (1 hour)

I will give an overview of some recent developments concerning special types of integrable deformations that go under the name of eta (or Yang-Baxter) deformations. Focusing on eta-deformations of the AdS5xS5 superstring, I will explore the fate of Weyl invariance under these deformations and analyse the worldsheet scattering theory of the deformed models.

Presenter: SEIBOLD, Fiona (ETH)

Session Classification: Strings web seminars

Contribution ID: **44** Type: **not specified**

SQCD and pairs of pants

Thursday, 22 April 2021 14:30 (1 hour)

In this talk we will overview some approaches to study 4d strong coupling phenomena. In particular we will discuss a geometric re-interpretation of N=1 SQCD with special unitary gauge groups. We will argue that the 4d SU(M) SQCD in the middle of the conformal window can be engineered by compactifying certain 6d SCFTs on three punctured spheres. We will also discuss in this context the interplay between simple geometric and group theoretic considerations and field theoretic strong coupling phenomena. We will show how many known and novel dualities and symmetry emergence phenomena of supersymmetric gauge theories, with simple and semi-simple special unitary gauge groups, are related to the Weyl group of D_{6+2K}.

Presenter: RAZAMAT, Schlomo (Technion)

Session Classification: Strings web seminars

Contribution ID: **45** Type: **not specified**

Chaotic scattering in quantum field theory and string theory

Wednesday, 5 May 2021 15:00 (1 hour)

Presenter: Dr ROSENHAUS, Vladimir (IAS - Princeton)

Session Classification: Tor Vergata String Seminars

Contribution ID: **46** Type: **not specified**

Holography, 1-Form Symmetries and Confinement

Thursday, 6 May 2021 14:30 (1 hour)

I will discuss confinement in 4d N = 1 SU(N) Super-Yang Mills (SYM) from holography, focusing on the 1-form symmetry and the holographic realization in terms of the Klebanov-Strassler solution. I will show how from the 5d consistent truncation it is possible to identify the topological couplings that determine the 1-form symmetry (and thus global forms of the gauge group) and its ’t Hooft anomalies. One of the topological couplings corresponds to a mixed 0-1-form symmetry anomaly, which is related to chiral symmetry breaking in the infrared (IR) vacuum. I will also show how to derive this anomaly from the Maldacena-Nunez solution and Little String Theory realizations of pure SYM. I will then discuss how other couplings in the 5d supergravity description of the IR Klebanov-Strassler solution lead to a 4d Topological Field Theory (TQFT) in the boundary, which saturates the mixed anomaly.

Presenter: APRUZZI, Fabio (University of Oxford)

Session Classification: Strings web seminars

Contribution ID: **47** Type: **not specified**

The Gravitino and the Swampland

Thursday, 20 May 2021 14:30 (1 hour)

We propose a new swampland conjecture stating that the limit of vanishing gravitino mass corresponds to the massless limit of an infinite tower of states and to the consequent breakdown of the effective field theory. We test our proposal in large classes of models coming from compactification of string theory to four dimensions, where we identify the Kaluza-Klein nature of the tower of states becoming light. We point out a general relation between the gravitino mass and abelian gauge coupling in models with extended supersymmetry, which can survive also in examples with minimal supersymmetry. This allows us to connect our conjecture to other well established swampland conjectures, such as the weak gravity conjecture or the absence of global symmetries in quantum gravity. We discuss phenomenological implications of our conjecture in (quasi-)de Sitter backgrounds and extract a lower bound for the gravitino mass in terms of the Hubble parameter.

Presenter: Dr SCALISI, Marco (Max-Planck-Institute, Munich)

Session Classification: Strings web seminars

Contribution ID: **48** Type: **not specified**

Complementarity Probes of BSM between Sky and the Lab via RGE: Higgs Inflation and Inflaton Hunt at Light Dark Sector Experiments

Monday, 28 June 2021 15:00 (1 hour)

We investigate in a conformally extended BSM scenarios radiative plateau Higgs inflation while dynamically generating the Electroweak and Seesaw scales via Coleman-Weinberg. The inflationary flat potential is a result of cancellations of quantum corrections between the gauge and Yukawa couplings. We show the theoretically consistent parameter space regions in LHC searches for this particle as well as in CMB.
Thus we will conclude by promoting RGE as a novel connection to complement laboratory searches of BSM with cosmological observables as probes of BSM models.

Presenter: GHOSHAL, Anish (Laboratori Nazionale Frascati - I.N.F.N. & University Roma Tre)

Session Classification: Tor Vergata String Seminars

Contribution ID: **49** Type: **not specified**

Black hole microstates from the worldsheet

Monday, 31 May 2021 15:00 (1 hour)

Presenter: BUFALINI, Davide (Università degli Studi di Roma "Tor Vergata")

Session Classification: Tor Vergata String Seminars

Contribution ID: **50** Type: **not specified**

Where is String Theory?

Monday, 14 June 2021 15:00 (1 hour)

Presenter: GUERRIERI, Andrea Leonardo (ROMA2)

Session Classification: Tor Vergata String Seminars