Talks

Banerjee, Sibasish

Title: *D-instantons, mock modular forms and BPS partition functions*
Abstract: I'll discuss the modular properties of D3-brane instantons appearing in Calabi-Yau string compactifications. I'll show that the D3-instanton contribution to a certain geometric potential on the hypermultiplet moduli space can be related to the elliptic genus of (0,4) SCFT. The modular properties of the potential imply that the elliptic genus associated with non-primitive divisors of Calabi-Yau is only mock modular. I'll show how to construct its modular completion and prove the modular invariance of the twistorial construction of D-instanton corrected hypermultiplet moduli space.

Bueno, Pablo

Title: *Holographic torus entanglement and its RG flow*
Abstract: We study the universal contribution to the entanglement entropy of three and four-dimensional holographic conformal field theories (CFTs) on tori. We characterize the properties of this universal quantity, denoted as , as a function of the cylindrical entangling region size and the aspect ratios of the corresponding tori cycles. In the limit in which the torus becomes a cylinder and the entangling region spans half of it, becomes constant both in three and four dimensions. We explore the possibility that a renormalized version of such quantity can be an RG-monotone by deforming the bulk theory with relevant operators.

Cano, Pablo Antonio

Title: *Black holes in Einsteinian cubic gravity*
Abstract: I will present a new higher-order gravity which satisfies the following properties: (1) it only propagates a massless spin-2 field on the vacuum, (2) the form of the Lagrangian is dimension-independent and (3) it is not trivial nor topological in four dimensions. Up to cubic order in curvature, I will show that the only theory satisfying these requirements is Einstein-Hilbert plus a previously unnoticed cubic term. Remarkably, this theory allows for black hole solutions characterized by a single function and whose mass, entropy and Hawking temperature can be computed exactly. I will show that the first and second law hold for these black holes.

Carta, Federico

Title: *Hilbert Series and Mixed Branches of the 3d, $N = 4$, $T[SU(N)]$ theory*
Abstract: We consider mixed branches of 3d, $N = 4$ $T[SU(N)]$ theories. Motivated by the type IIB brane construction, we propose a restriction rule acting on the Hilbert Series of the full Coulomb branch that will truncate the magnetic charge summation only to the subset of BPS dressed monopole operators that arise in the Coulomb branch part of a given mixed branch.

We check this proposal in explicit examples, and we further generalize it to the Higgs branch part of a given mixed branch, by exploiting 3d mirror symmetry. As a result, we are able to compute the Hilbert Series of any mixed branch of $T[SU(N)]$.

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de Felice, Oscar

Title: *Consistent truncations of supergravity theories: an application for massive type IIA*
Abstract: We develop an exceptional generalised geometry description of massive type IIA supergravity. In particular the construction of the deformation of generalised Lie derivative is shown. Generalised Lie derivative generates gauge transformations, as modified by the Romans mass. The application of this formalism to the construction of consistent truncations is described in a general way, and then by some example. Furthermore a no-go result for S^3 is discussed.

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del Rio Vega, Adrian

Title: *Electromagnetic duality anomaly in curved spacetime*
Abstract: The source-free Maxwell action is invariant under electric-magnetic duality rotations in arbitrary spacetimes. This leads to a conserved classical Noether charge. We find that this conservation law is broken at the quantum level in presence of a background classical gravitational field with a non-trivial Chern-Pontryagin invariant, in a parallel way to the chiral anomaly for massless Dirac fermions. Among the physical consequences, the net polarization of the quantum electromagnetic field is not conserved.

Diaz Dorronsoro, Juan

Title: *String theory and dark energy*
Abstract: The accelerated rate of expansion of our universe is one of the most promising empirical results to test string theory. The leading proposal to account for it is the so-called KKLT mechanism. In this talk, I will review the main ideas behind the proposal and discuss certain issues that cast doubts upon its validity. Then I will present recent work that attempts to address these issues, based on 1507.01022; 1511.07453; and 1603.05678.

Escobar Atienzar, Dagoberto

Title: *Soft SUSY breaking terms in Type IIA flux compactifications*
Abstract: We consider compactifications of Type IIA string theory on Calabi-Yau orientifolds with non-trivial background fluxes and intersecting D6-branes, supporting chiral gauge theories on their worldvolumes. The background fluxes allow for the stabilisation of the closed string moduli and simultaneously provide sources for spontaneous supersymmetry breaking which induce soft terms on the D6-brane worldvolumes. We investigate the structure of the soft terms for a simple toy model and apply the results to the Higgs-axion sector in a DFSZ axion model.

Ezquiaga, Jose Maria

Title: *Constructing general scalar-tensor theories of gravity: are they viable?*
Abstract: Nowadays, there is great interest in the scientific community to find which is the most general Scalar-Tensor (ST) theory. The reason is that ST theories are very useful to describe periods of accelerated expansion such as in the Early and Late Universe, i.e inflation and dark energy. In this talk, I will first review briefly how to construct ST theories without instabilities. Then, I will present a novel approach to build general ST theories that naturally incorporates the requirements to avoid unwanted degrees of freedom. This new formalism affords great computational simplicity with a systematic structure. Finally, I will discuss how this family of theories can be severely constrained with future gravitational wave observations.

Fernandez Pendas, Jorge

Title: *The holographic Weyl semi-metal*
Abstract: Weyl semi-metals are a new exciting class of materials realizing the chiral anomaly in condensed matter physics. I present a holographic model of a Weyl semi-metal and compute the Hall conductivities from the holographic anomalies. An apparent mismatch in the symmetry factor of 1/3 in the triangle diagram is overcome by interpreting the result via the holographic RG flow.

Fontanella, Andrea

Title: *Anomaly Corrected Heterotic Horizons*
Abstract: Stringy corrections to supergravity event horizons are considerably of interest for investigating quantum corrections to black holes, in particular the singularity resolution and the small black hole problem. A general feature like supersymmetry enhancement on the horizons has been investigated in higher derivative theory in five dimensions, and proven to fail. I shall present the analysis undertaken for heterotic horizons up to two loop order in sigma model perturbation theory. The conditions for the horizons to admit enhancement of supersymmetry will be presented and shown that solutions which undergo supersymmetry enhancement exhibit an sl(2, R) symmetry. Global theorems incorporating α corrections, in particular a modified Lichnerowcz type theorem, will be shown. As a consequence, I shall demonstrate that there are no $AdS2$ solutions in heterotic supergravity up to second order in α, which completes the classification of supersymmetric heterotic backgrounds. Nearly supersymmetric solutions will be considered, and the description of the geometry presented.
The talk is based on hep-th/1605.05635 with J. B. Gutowski and G. Papadopoulos.

Garcia Valdecasas Tenreiro, Eduardo

Title: *3-forms, axions and D-brane instantons*
Abstract: Axions are useful for realising inflation and appear ubiquitously in string theory.

They can be recast as 2-forms coupling to 3-forms. In some string settings an axion arise but the 3-form is not found. When instantons coupling to the axion are introduced the geometry is deformed and a 3-form arises in the new non CY geometry, thus solving the puzzle.

Gordo, David

Title: *High energy effects in multi-jet production at LHC*
Abstract: We study differential cross sections for the production of three and four jets in multi-Regge kinematics, the main interest lying on azimuthal angle dependences. The theoretical setup is the jet production from a single BFKL ladder with a convolution of two/three BFKL Green functions, where two forward/backward jets are always tagged in the final state. Furthermore, we require the tagging of one/two further jets in more central regions of the detectors with a relative separation in rapidity. We found, as result, that the dependence on transverse momenta and rapidities of the central jets can be considered as a distinct signal of the onset of BFKL dynamics.

Herrero Valea, Mario

Title: *Albert through the looking glass*
Abstract: Gravitational theories with scale invariance have received a lot of attention through the recent years both because of their promising quantum properties and because they naturally incorporate many useful aspects in cosmology. Under a non-linear field redefinition, these theories can be taken to a more natural Einstein frame, where they behave as a set of scalar fields minimally coupled to gravity and standard intuition can be used in order to extract physical answers. Here we study an obstruction to this construction through the presence of scale anomalies, which generate new contributions to the S-matrix only in one of the frames.

Ibanez Bribian, Eduardo

Title: *Perturbative running of the twisted Yang-Mills coupling in the gradient flow scheme*
Abstract: The study of the link between gauge and space-time degrees of freedom in twisted SU(N) Yang-Mills theory was first introduced in the eighties, when space-time degrees of freedom on the lattice were shown to be redundant in the large N limit. This idea of volume independence has been resurrected in the last decade, both on the lattice and the continuum, and is in the process of being thoroughly tested.
In this talk we will briefly introduce the concept of volume independence in twisted Yang-Mills theory, present the gradient flow method and show our ongoing computation of the perturbative running of the twisted 't Hooft coupling using said method.

Ireson, Edwin

Title: *Worldsheet induced corrections to the holographic Veneziano amplitude*
Abstract: 48 years ago, the Veneziano amplitude was formulated to model the 2→2 scattering

of mesons, the analysis of which was a cornerstone for the formulation of early string theory. Now, modern string theory is concerned with the holographic duality, involving highly curved spaces in which Veneziano's result is not easily seen, but which in theory should give a better approximation to the realistic meson scattering amplitude, one that includes physics of confinement and asymptotic freedom. We derive a set-up that can, in certain limits, produce a correction to the standard Veneziano result, coming from the curvature of the holographic duals involved, that aims to implement these improvements systematically, and discuss the consistency of the result.

Lara, Iaki

Title: *Searching for left-handed sneutrino LSP at the LHC*
Abstract: The "μ from ν" supersymmetric standard model (SSM) provides a solution to the μ problem of the MSSM and simultaneously reproduces correct neutrino physics by simply using right-handed neutrino superfields. These new superfields together with the introduced R-parity violation can produce novel and characteristic signatures of the $\mu\nu$SSM at the LHC.
We explore the most relevant signals expected for a left-handed sneutrino as the lightest supersymmetric particle. In paticular, discussing a diphoton signal plus missing transverse energy and plus leptons, as a possible signal to be detected at the end of current Run II.

Lasso, Oscar

Title: *On SO(3)-gauged maximal d=8 supergravities*
Abstract: I will show how the tensor hierarchy of generic, bosonic,8-dimensional field theories is built. Studying the form of the most general 8-dimensional bosonic theory with Abelian gauge symmetries only and no massive deformations we determined the tensors that occur in the Chern-Simons terms of the (electric and magnetic) field strengths and the action for the electric fields, which we calculate. Having constructed the most general Abelian theory we study the most general gaugings of its global symmetries and the possible massive deformations using the embedding tensor formalism, constructing the complete tensor hierarchy using the Bianchi identities. We find the explicit form of all the field strengths of the gauged theory up to the 6-forms and also the equations of motion. We find that some equations of motion are not simply the Bianchi identities of the dual fields, but combinations of them. With the results at hand I will show how to construct explicitly a 1-parameterfamily of SO(3)-gauged maximal d=8 supergravities that interpolates continuously between the theory constructed by Salam and Sezgin by Scherk-Schwarz compactification of d=11 supergravity and the theory constructed in hep-th/0012032v2 by dimensional reduction of the so called "massive 11-dimensional supergravity" proposed by Meessen and Ortn earlier.
The talk is based on the articles: hep-th/1605.05882v1, hep-th/1605.09629v2.

Martin Garcia, Javier

Title: *Holographic complexity*
Abstract: Twenty years after the Maldacena model for holography, new entries for the AdS/CFT

dictionary still being created. After a brief review of holographic entanglement entropy and its interpretation in terms of holographic tensor networks, I will introduce some recent proposals about the bulk dual to the quantum computational complexity. With these tools, we compute the complexity of a peculiar degenerate system, i.e. near-extremal hyperbolic black holes, and study its anomalous behaviour.

Marzolla, Andrea

Title: *The Poincaré invariant massive 3-point amplitude in spinor-helicity formalism*
Abstract: Using the helicity-spinor language, we have explored the non-perturbative constraints that Lorentz symmetry imposes on three-point amplitudes where the asymptotic states can be massive, in a similar spirit as Benincasa and Cachazo have already done for the 3-point amplitude involving only massless particles, which turns out to be fully determined up to a constant (coupling), and constitutes the building block for many on-shell recursion relations.
I will review the derivation in the massless case, enlightening the role of the little group covariance of the amplitude in constraining its functional form, and the particularly simple form that these constraints get in the spinor-helicity formalism.
Then I will show how to extend these procedure to the massive case, deriving the constraining equations for the massive little group, and eventually obtaining that also the 3-point amplitudes involving one, two, or three massive particles are fully determined by Poincaré invariance, up to some (several) constants.
The talk would be mostly based on hep-th/1601.08113.

Medrano, Diego

Title: *Planar Zeros in Gauge Theories and Gravity*
Abstract: Planar zeros are studied in the context of the five-point scattering amplitude for gauge bosons and gravitons. In the case of gauge theories, it is found that planar zeros are determined by an algebraic curve in the projective plane spanned by the three stereographic coordinates labelling the direction of the outgoing momenta. This curve depends on the values of six independent color structures. Considering the gauge group SU(N) with N = 2, 3, 5 and fixed color indices, the class of curves obtained gets broader by increasing the rank of the group. For the five-graviton scattering, on the other hand, we show that the amplitude vanishes whenever the process is planar, without imposing further kinematic conditions. A rationale for this result is provided using color-kinematics duality.

Min, Vincent

Title: *Entanglement equilibrium and higher-order gravity*
Abstract: We consider the generalization to higher-order gravity of Ted Jacobson's Maximal Vacuum Entanglement Hypothesis (MVEH) introduced in 1505.04753. The MVEH is a statement about the entanglement structure of the vacuum of QFTs. One can show that the MVEH implies that the Einstein equations must hold. We elucidate the origin of the MVEH as a microscopic interpretation of a classical identity in Einstein gravity called the First Law of Diamond

Mechanics (FLDM). Starting from the FLDM for higher-order gravity, we construct a generalization of the MVEH and show that it implies the linear equations of motion for higher-order gravity.

Mladenov, Stefan

Title: *Entanglement entropy of Pais-Uhlenbeck oscillators and excited holographic states*
Abstract: We study the quantum entanglement of coupled Pais-Uhlenbeck oscillators using the formalism of thermo-field dynamics. The entanglement entropy is computed for the specific cases of two and a ring of N coupled Pais-Uhlenbeck oscillators of fourth order. It is shown that the entanglement entropy depends on the temperatures, frequencies and coupling parameters of the different degrees of freedom corresponding to harmonic oscillators. We then advert to the information geometry theory by calculating the Fisher information metric for the considered system of coupled oscillators. On the other hand, the 2d CFT vacuum is invariant under the SL(2,C) subgroup of global conformal transformations. Apart from such transformations, the vacuum transforms into excited states. According to the holographic conjecture, the identity operator, the stress tensor, and arbitrary products of the stress tensor with its derivatives, capture the gravitational sector of the holographic dual theory. For this reason, we consider a class of univalent conformal transformations realized by a unitary operator, which transform the stress tensor by a Schwarzian derivative. It has been shown recently that the entanglement entropy of such excited states, calculated using replica trick, is related to the Aharonov invariants, Grunsky coefficients, and tau-functions of dispersionless Toda hierarchy. Given the Virasoro expansion of the stress tensor, we explore all these relations and the action of the Virasoro operators on the class of univalent functions.

Musso, Daniele

Title: *QGP optical properties from gauge/gravity correspondence?*
Abstract: Negative refraction and other "exotic" optical properties are a generic feature in media with a spatially non-local electromagnetic response. One such example is a strongly coupled, non-Abelian and neutral plasma described in AdS/CFT which furnishes a toy model for QGP in the temperature-dominated regime. Explicit computations show the possibility of negative refraction with negligible dissipation for light propagating in the plasma. This could be associated with inverse Snell's law at the interface of the QGP drop and alter significantly the photon angular distribution without affecting the total intensity. The goal is to explore a possible alternative way to tackle the QGP "photon puzzle" refining the paradigm of the QGP transparency.

Oliveri, Roberto

Title: *Near-horizon Extreme Kerr Magnetospheres*
Abstract: Black holes surrounded by an accreting plasma admit a very rich dynamics. Under the assumption of vanishing Lorentz force density and negligible matter backreaction, the dynamics of the black hole magnetosphere is governed by Force-Free Electrodynamics (FFE) in

the fixed background geometry. The FFE equations are highly nonlinear and typically can only be solved numerically. In this talk, I consider FFE in the Near-Horizon geometry of an Extreme Kerr black hole (NHEK). First, I show how several classes of exact analytical solutions can be found thanks to the enhanced isometry group of NHEK spacetime. Second, I characterize those potentially physical solutions with finite energy and angular momentum fluxes with respect to the asymptotically flat observer.

Orejuela, Jose Alberto

Title: *On the (non-)uniqueness of the Levi-Civita solution in the Einstein-Hilbert-Palatini formalism*
Abstract: We study the most general solution for affine connection that is compatible with the variational principle in the Palatini formalism for the Einstein-Hilbert action (with possible minimally coupled matter terms). We find that there is a family of solutions generalizing the Levi-Civita connection, characterized by an arbitrary, non-dynamical vector field $A_m u$. We discuss the mathematical properties and the physical implications of this family and argue that, although there is a clear mathematical difference between these new Palatini connections and the Levi-Civita one, both unparametrised geodesics and the Einstein equation are shared by all of them and. Based on this, we conclude that physical effects associated to the choice of one or the other will not be distinguishable, at least not at the level of solutions or test particle dynamics. We propose a geometrical intepretation for the existence and inobservability of the new solutions.

Orta, Andrea

Title: *Towards the Amplituhedron Volume*
Abstract: The amplituhedron conjecture was advanced a few years ago as a means to gain a geometric understanding of scattering amplitudes in planar N=4 super Yang-Mills theory. According to it, an amplitude can be understood as the volume of the relevant (dual) amplituhedron space, rather than as some sum of Feynman diagrams.
In this talk I will explain how a particular set of differential equations completely determines the volume form in the case of NMHV tree-level amplitudes.

Pan, Yiwen

Title: *Intersecting Surface Defects and Two Dimensional CFT*
Abstract: Supersymmetric intersecting surface defects in four-dimensional N=2 theories can be viewed as coupled 4d/2d/0d supersymmetric systems preserving two supercharges. Their partition functions can be identified with Liouville/Toda correlators via a generalization of AGT correspondence. In this talk I will discuss the construction of such defects in four-dimension N=2 theories and their partition functions. We will start by reviewing some relevant backgrounds. Then we move on to a simple example of a system of free hypermultiplets in the presence of intersecting defects. We present its partition function and match it with a Liouville four-point function. We also present a Seiberg-like duality between two quiver descriptions of

the same intersecting defects, and an alternative way of obtaining the partition functions via Higgsing 4d N=2 SQCD.

Penin Ascariz, Jose Manuel

Title: *Unquenched matter in D3-D5 theories*
Abstract: We briefly discuss the main aspects of the addition of flavor in the gravity-gauge correspondence and focus on our recent work (1607.04998) in which we construct string duals of the defect theories generated when N_f flavor D5-branes intersect N_c color D3-branes along a 2+1 dimensional subspace. We work in the Veneziano limit in which N_c and N_f are large and N_f/N_c is fixed. By smearing the D5-branes, we find supergravity solutions that take into account the backreaction of the flavor branes and preserve two supercharges. When the flavors are massless the resulting metric displays an anisotropic Lifshitz-like scale invariance. We also consider the case of massive quarks and the addition of temperature.

Risoli, Stefano

Title: *P-fluxes and exotic branes*
Abstract: We show how in simple IIA/IIB N=1 orientifold models exotic branes can be added and P-fluxes (i.e. S-dual of the Q-flux and its T-duals) can be turned on consistently with the minimal amount of supersymmetry. In particular, we show how several BI and tadpole cancellation conditions have to be modified or built from scratch and furnish a generalization of the IIA (IIB) superpotential.

Ronco, Michele

Title: *Deformed symmetries in noncommutative and multifractional spacetimes*
Abstract: We clarify the relation between noncommutative spacetimes and multifractional geometries where the spacetime dimension changes with the probed scale. In the absence of curvature and comparing the symmetries of both position and momentum space, we show that κ-Minkowski spacetime and the commutative multifractional theory with q-derivatives are physically inequivalent but they admit several contact points that allow one to describe certain aspects of κ-Minkowski noncommutative geometry as a multifractional theory and vice versa. Contrary to previous literature, this result holds without assuming any specific measure for κ-Minkowski. More generally, no well-defined *-product can be constructed from the q-theory, although the latter does admit a natural noncommutative extension with a given deformed Poincar/'e algebra. A similar no-go theorem may be valid for all multiscale theories with factorizable measures. Turning gravity on, we write the algebras of gravitational first-class constraints in the multifractional theories with q- and weighted derivatives and discuss their differences with respect to the deformed algebras of κ-Minkowski spacetime and of loop quantum gravity.

Santoli, Camilla

Title: *Supersymmetric solutions of SU(2)-Fayet-Iliopoulos-gauged N=2, d=4 supergravity*
Abstract: We found the first supersymmetric solutions of theories of N=2, d=4 supergravity with a SU(2) gauging and SU(2) Fayet-Iliopoulos terms. In these theories an SU(2) isometry subgroup of the Special Kahler manifold is gauged together with a SU(2) R-symmetry subgroup. We constructed several solutions of the CP3 quadratic model directly in four dimensions and of the ST[2,6] model by dimensional reduction. In the CP3 model, we construct an AdS2xS2 solution which is only 1/8 BPS and an RxH3 solution that also preserves 1 of the 8 possible supersymmetries. We show how to use dimensional reduction to obtain RnxSm and also AdSnxSm-type solutions in 5 and 4 dimensions from the 6-dimensional AdS3xS3 solution.

Scarcella, Francesca

Title: *Charged lepton flavour violation from low scale seesaw neutrinos*
Abstract: Besides successfully accommodating neutrino oscillations data, seesaw models predict interactions that would induce processes violating flavour in the charged lepton sector. We study the predictions for different cLFV observables within the Inverse Seesaw model. In particular, we explore the possibility of obtaining sizable branching ratios for processes such as LFV decays of the Z boson. We find that decay rates in the reach of future linear colliders can be predicted in association with heavy neutrinos having masses in the range of interest of present ones.

Sisca, Roberto

Title: *Towards a connection for heterotic geometry*
Abstract: It is known that at large compactification radius perturbative heterotic vacua with geometry $R^{3,1} \times X$ have X being a Calabi-Yau manifold endowed with a stable holomorphic vector bundle. The set of these vacua forms a Moduli Space and has its own geometry. We are interested in how α'-corrections affects this parameter space geometry.
In a recent paper the α'-corrected metric on the Moduli Space was obtained and in this talk we will elucidate how the understanding of this metric can be improved through a new way of describing the dependence of fields on parameters. Such description is based on the choice of a connection for the family of manifolds X over the Moduli Space.

Torrenti, Francisco

Title: *Higgs-curvature coupling and vacuum stability after inflation*
Abstract: Current measurements of the top quark and Higgs masses suggest that the Standard Model potential becomes negative at very high energies. This can make the electroweak vacuum unstable in the early Universe. In my talk, I will focus on the potential vacuum instability during the era of preheating following inflation. In particular, inflaton oscillations during this

epoch induce rapid changes in the spacetime curvature. If the Higgs possesses a large enough non-minimal coupling to the scalar curvature, the strong gravitational particle creation triggers a transition to a negative-energy Planck scale vacuum state, causing the immediate collapse of the Universe. I will discuss how we can use classical lattice simulations to constrain the range of couplings compatible with vacuum stability after inflation. We assume a minimal scenario, with an inflaton with parabolic potential and no additional new physics below the Planck scale. We find vacuum stability is only ensured for approximately xi < 10, while for larger couplings the vacuum becomes unstable after just one/two oscillations of the inflaton field.

Vreys, Yannick

Title: *On the many uses of squashed spheres*
Abstract: Holography is considered as a widely accepted calculational tool nowadays. Although there are only a handful of string theory constructions that relate AdS spaces to conformal field theories, there have been a lot of qualitative models which suggest that holography is a general property of quantum gravity. We will extend the qualitative number of models for which the duality applies by studying CFTs on deformations of the round sphere. In particular we apply two squashings and find numerically new AdS solutions which share this double squashed boundary sphere with the free O(N) model for which we calculate the partition function. These particular models will be useful when the holographic dictionary is extended to cosmological relevant dS spaces, because they can model anisotropic universes. If there is time I will also try to discuss a particular interesting feature of the squashed sphere which seems to indicate that for all kinds of different CFTs the free energy is only dependent on two parameters.

Zatta, Marco

Title: *Higgs instability during and after inflation*
Abstract: Current Higgs boson and top quark data favour metastability of our vacuum which raises questions as to why the Universe has chosen an energetically disfavoured state and remained there during the primordial dynamics. In this talk I will point out that allowing a simple Higgs-inflaton coupling can explain why the Higgs ended up in the electroweak vacuum after inflation. I will show that this coupling is present in many realistic models of reheating and thus well motivated. I will also discuss the effects of the Higgs-inflaton coupling during the initial period of reheating, known as preheating, where the sizable production of Higgs particles can induce large fluctuations of the Higgs field which may destabilize the electroweak vacuum.

Zwikel, Celine

Title: *BTZ black holes, warped AdS3 black holes and flat space cosmologies in higher derivative gravity theories*
Abstract: In this talk, we consider warped AdS3 black holes, BTZ black holes and flat space cosmologies in generic higher derivative gravity theories in 2+1 dimensions. Using the covariant phase space formalism, we prove the match between the bulk Iyer-Wald entropy of these solutions and the field theory entropy for the corresponding asymptotic symmetry algebras (CFT2,

Warped CFT2, BMS3). This talk is based on the following papers: hep-th/1604.02120v2 and hep-th/1602.09089v2.