



# Report of Contributions

Contribution ID : 3

Type : **not specified**



*Saturday, 29 June 2019 10:00 (30)*



**Session Classification :** Morning sessions

Contribution ID : 4

Type : **not specified**

## Review on Charmed Baryon Decays

*Saturday, 29 June 2019 10:30 (30)*

**Presenter(s)** : XX, X (XXXXXX)

**Session Classification** : Morning sessions

Contribution ID : 5

Type : **not specified**

## Fundamental oscillation modes of self-interacting bosonic dark stars

*Saturday, 29 June 2019 11:00 (30)*

We perform a detailed analysis of the fundamental f-mode frequencies and damping times of nonrotating stellar-mass boson stars in general relativity by solving the nonradial perturbation equations. Two parameters which govern the microscopic properties of the bosonic condensates, namely the self-coupling strength and the mass of the scalar particle, are explored. These two quantities characterize oscillations of boson stars. Specifically, we reexamine some empirical relations that describe the f-mode parameters in terms of the mass and radius of boson stars.

**Presenter(s)** : ,  (XXXX)**Session Classification** : Morning sessions

Contribution ID : 6

Type : **not specified**

## Effective Quintessence Potential from Landscape

*Saturday, 29 June 2019 11:50 (30)*

**Presenter(s)** : ( ) ( )

**Session Classification** : Morning sessions

Contribution ID : 7

Type : **not specified**

# **Light Fermionic WIMP Dark Matter with Light Scalar Mediator**

*Saturday, 29 June 2019 12:20 (30)*

**Presenter(s)**: XX, X (XXXXXXXXXXXXXXXX)

**Session Classification** : Morning sessions

Contribution ID : 8

Type : **not specified**

## The Quest for Neutrino Mass Ordering

*Saturday, 29 June 2019 12:50 (30)*

Neutrino mass is currently the only sign of new physics beyond the Standard Model (SM) of particle physics. Unfortunately, due to the challenges in measuring the three absolute neutrino masses, we currently only know the two mass-squared differences manifested in neutrino oscillation data. The mass ordering is very likely to be the first experimental handle we could have on physics related to neutrino mass. A concrete experimental measurement could provide invaluable clues to the fundamental questions in particle physics. In this talk, we will give a general review on neutrino physics, the discovery of neutrino oscillation and its recent experimental progresses, and explain the different experimental efforts of measuring neutrino mass ordering. We will then focus more on the only reactor neutrino oscillation experiment resolving neutrino mass ordering: the Jiangmen Underground Neutrino Observatory (JUNO), which takes the advantage of the powerful nuclear reactors in Guangdong Province of China. We will explain its design, recent progresses and its physics opportunities.

**Presenter(s)** :   (XXXX)**Session Classification** : Morning sessions

Contribution ID : 9

Type : **not specified**

## **Prepotential approach: A unified approach to exactly, quasi-exactly, and rationally extended solvable quantal systems**

*Saturday, 29 June 2019 16:00 (30)*

We would like to demonstrate how all the known 1D exactly solvable, quasi-exactly solvable, and the recently discovered rationally extended solvable potentials, including those related to the exceptional orthogonal polynomials, can be constructed in a direct and systematic way, which we called the prepotential approach. In this approach, the prepotential, the deforming function, the potential, the eigenfunctions and eigenvalues are all derivable within the same framework, without the need of supersymmetry, shape invariance, or Darboux-Crum transformations.

**Presenter(s)** : , ( )**Session Classification** : Afternoon sessions

Contribution ID : **10**

Type : **not specified**

**-3**

*Saturday, 29 June 2019 16:30 (30)*

**Presenter(s)** : (ITP-CAS)

**Session Classification** : Afternoon sessions



Contribution ID : 11

Type : **not specified**

## **A possible connection of the broken power law between electron- and proton- spectra**

*Saturday, 29 June 2019 17:00 (30)*

Using the gluon condensation (GC) model, we predict a possible connection between the energy spectra of electron and proton. When GC occurring, large amount of gluons accumulate near the GC threshold, this phenomenon provides a possible source of the power rule broken in the energy spectra of cosmic rays, and also it predicts the connections between them.

**Presenter(s)** : Prof. ,  (East China Normal University)

**Session Classification** : Afternoon sessions




Contribution ID : 12

Type : **not specified**

## Neutron star configurations confronting dark matter and neutron lifetime anomaly

*Saturday, 29 June 2019 17:50 (15)*

The nature of dark matter (DM) has been one of major problems in physic. The stability and abundance of dark matter suggest possibility that the DM may play an important role for compact stellar objects. Confronting the recent neutron lifetime anomaly measurement in laboratories in Beam experiments and Bottle experiments. We propose the neutron decays into a DM and a new scalar boson to resolve the anomaly. The new scalar boson and a new U(1) dark gauge symmetry are the portals with dark sectors and visible sectors. We study the stability and formation of neutron star result from the interplay between DM and neutrons. The DM mass and mediator mass suggest different mass-radius relation of the two components neutron star. We further investigate its tidal deformability and the corresponding gravational waveforms. The results might help to reveal the nature of underlying physics in the future gravitational wave detection.

**Presenter(s)** : ,  ()**Session Classification** : Afternoon sessions

Contribution ID : **13**

Type : **not specified**

## **Antitriplet charmed baryon decays with SU(3) flavor symmetry**

*Saturday, 29 June 2019 18:05 (15)*

**Presenter(s)** : XX, X (XXXXXX)

**Session Classification** : Afternoon sessions

Contribution ID : 14

Type : **not specified**

## **Charmed baryon Three-body decays with SU(3) flavor symmetry**

*Saturday, 29 June 2019 18:20 (15)*

**Presenter(s)** : [redacted], [redacted] ([redacted])

**Session Classification** : Afternoon sessions

Contribution ID : **15**

Type : **not specified**

# Reception

*Saturday, 29 June 2019 20:00 (60)*

Contribution ID : 16

Type : **not specified**

## **Gravitational waves induced by scalar perturbations**

*Sunday, 30 June 2019 10:30 (30)*

**Presenter(s) :** XX, X (XXXXXXXXXX)

**Session Classification :** Morning sessions

Contribution ID : 17

Type : **not specified**

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*Sunday, 30 June 2019 11:00 (30)*

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**Presenter(s) :** , (

**Session Classification :** Morning sessions

Contribution ID : 18

Type : **not specified**

## **Gravitational waves and extra dimensions: a short review**

*Sunday, 30 June 2019 11:30 (30)*

**Presenter(s)** : XX, X (XXXX)

**Session Classification** : Morning sessions

Contribution ID : 19

Type : **not specified**

## Gravitational waves and cosmology

**Presenter(s)** :  $\square, \square$  (XXXX)

**Session Classification** : Morning sessions

Contribution ID : 20

Type : **not specified**

## Extension of scalar-tensor theories and spatially covariant gravity

*Sunday, 30 June 2019 12:50 (30)*

In order to explain the accelerated expansion of our universe in its early stage and today, the most popular approach is to introduce a scalar field to drive the inflation or to act as dark energy. This is the so-called scalar-tensor theory of gravity. In this talk, we first review the development of the scalar-tensor theories with higher derivatives in the recent years. Then we introduce the idea of constructing gravity theories respecting only the spatial symmetry, which propagate a single scalar degree of freedom and thus correspond to even larger class of healthy scalar-tensor theories with higher derivatives. Finally we discuss the propagation of gravitational waves in our framework.

**Presenter(s)** :   (XXXX)**Session Classification** : Morning sessions

Contribution ID : 21

Type : **not specified**

## Charge Emission from Charged Black Holes

*Sunday, 30 June 2019 16:00 (30)*

The spontaneous pair production of charged scalars from near-extremal rotating, electrically and/or magnetically charged black holes is discussed. Analytical expressions for pair production, vacuum persistence and absorption cross section are found, and the spectral distribution is given a thermal interpretation. The associated holographical correspondence is confirmed at the 2-point function level by comparing the absorption cross section ratio as well as the pair production rate both from the gravity and the conformal field theories. A special case of charge emission from non-extremal black hole is studied.

**Presenter(s)** : [redacted], [redacted]**Session Classification** : Afternoon sessions

Contribution ID : 22

Type : **not specified**

## The dynamics of falling charge in gravitational field

The topic of a falling charge in gravitational field had surged quite a few times for the past decades. The equivalence principle was found to bring out different result from uniformly accelerated charge while concerning the radiation of the charge. The puzzle is still alive up to date. The problem lies in the heart of linking the electromagnetism with gravity, thus of unifying them. And extensively, it determines the understanding of the relationship between micro-interactions and gravity, as well as relationship between the Higgs particle and gravity. The past investigations have pointed to a quantum-gravitational motivation but using a classical point-charge model. In this paper we endow the charge with total quantum characteristics. Such model unveils the non-local aspects of a quantum charge, which masks the radiation essence while putting it in different coordinate-reference systems.

**Presenter(s)** :   (XXXX)

**Session Classification** : Afternoon sessions

Contribution ID : 23

Type : **not specified**

## Thermodynamical study on universal horizons in higher $D$ -dimensional spacetime and aether waves

*Sunday, 30 June 2019 16:30 (30)*

We investigate behaviors of the  $D$ -dimensional gravity coupled to a dynamical unit timelike vector, the aether, present two kinds of exact charged solutions and study the linearized wave spectrum of this theory. There is an universal horizon behind the Killing horizon in these aether black holes. We find that in the uncharged case, one can construct a Smarr formula and the (slightly modified) first law of black hole mechanics at the universal horizons for both kinds of black holes. An entropy can be associated with the universal horizon and a temperature can be defined there. For the second kind aether black hole and for the first kind one in the extremal higher dimensions, the charge should be severely constrained that  $\bar{Q} \ll \bar{r}_0/2$ . In this way, one can still construct such first law. For aether wave, our results show that the spin-1 and spin-2 modes are the same as those in 4-dimensional spacetime, and only the spin-0 one is different and dependant on the dimension number  $n$ .

**Presenter(s)** : [redacted], [redacted] ([redacted])**Session Classification** : Afternoon sessions

Contribution ID : 24

Type : **not specified**

## Positivity bounds in effective field theories

*Sunday, 30 June 2019 17:00 (30)*

Locality, unitarity and analyticity are some of the most fundamental properties of quantum field theory. I will show how requiring a local, analytic, unitary UV completion for a low energy effective theory (EFT) can impose positivity bounds on the Wilson coefficients of the EFT. These positivity bounds take the form of constraints on combinations of the pole subtracted scattering amplitude and its derivatives. I will first demonstrate the main idea with the simple case of a massive scalar field, and then discuss the technical subtleties that arise when generalising to cases with nonzero spins. These positivity bounds can be applied to any EFTs. As an illustration, I will apply these positivity bounds to a few well-known EFTs, including galileon, standard model effective field theory and massive gravity.

**Presenter(s)** : ,  (ICTS, USTC)**Session Classification** : Afternoon sessions

Contribution ID : 25

Type : **not specified**

## Holographic entanglement entropy and its bit-thread interpretation

*Sunday, 30 June 2019 18:20 (30)*

**Presenter(s)** : (X), X (XXXX)

**Session Classification** : Afternoon sessions

Contribution ID : 26

Type : **not specified**

## **Thermodynamics of f (R) Gravity with Disformal Transformation**

*Sunday, 30 June 2019 18:50 (15)*

**Presenter(s)** : , ( )

**Session Classification** : Afternoon sessions

Contribution ID : 27

Type : **not specified**

## Direct CP violation in charmed meson decays

*Monday, 1 July 2019 10:30 (30)*

In 2012 Cheng-Wei Chiang and I have studied direct CP violation in singly Cabibbo-suppressed D decays within the topological diagram approach. We concluded that the direct CP asymmetry difference  $\Delta A_{\text{CP}}$  between  $D^0 \rightarrow K^+ K^-$  and  $D^0 \rightarrow \pi^+ \pi^-$  is about  $(-0.139 \pm 0.004)\%$  and  $(-0.151 \pm 0.004)\%$  for the two solutions of W-exchange amplitudes, respectively. The first observation of CP violation in the charm sector was recently announced by LHCb with the result  $\Delta A_{\text{CP}} = (-0.154 \pm 0.029)\%$ . This is a great triumph of the standard model. In this talk I'll discuss its implications and present new predictions in other  $D \rightarrow PP$  and  $VP$  modes (P: pseudoscalar meson, V: vector meson).

**Presenter(s)** : [redacted], [redacted]**Session Classification** : Morning sessions

Contribution ID : 28

Type : **not specified**

## The QCD trace anomaly in the hadron

*Monday, 1 July 2019 11:00 (30)*

The QCD trace anomaly is the basic anomaly to make the massless hadron in the chiral limit to be massive. Its contribution to the hadron is predicted by the sum rule, while the direct calculation or experimental determination is absent until recently. I will show the theoretical progress and discuss the possible experimental opportunities.

**Presenter(s)** : XX , X (XXXXXXXXXX)

**Session Classification** : Morning sessions

Contribution ID : 29

Type : **not specified**

## Interactions between two heavy mesons within chiral perturbation theory

*Monday, 1 July 2019 11:30 (30)*

We have studied the interactions between two heavy mesons [ $D^{\Lambda}()$ - $D^{\Lambda}()$  or  $B^{\Lambda}()$ - $B^{\Lambda}()$ ] within heavy meson chiral effective field theory. The effective potentials are calculated with Weinberg's scheme up to one-loop level. At the leading order, four body contact interactions and one pion exchange contributions are considered. In addition to two pion exchange diagrams, we include the one-loop chiral corrections to contact terms and one pion exchange diagrams at the next-to-leading order. The behaviours of effective potentials both in momentum space and coordinate space are investigated and discussed extensively. We notice the contact terms play important roles in determining the characteristics of the total potentials. The possible molecular states are also investigated and the binding energies are provided by solving the Schrodinger equation.

**Presenter(s)** : [redacted], [redacted] ([redacted])**Session Classification** : Morning sessions





Contribution ID : 30

Type : **not specified**

## Threshold resummation at subleading power

*Monday, 1 July 2019 12:20 (30)*

We derive a threshold resummation formula at next-to-leading power employing the soft-collinear effective theory. The anomalous dimensions of subleading-power soft functions are calculated directly. As a result, we resum the leading logarithms near the kinematic threshold. Expansion of the resummed result leads to the leading logarithms at fixed orders, providing new results at the five-loop order and beyond.

**Presenter(s)** : ,  (, )**Session Classification** : Morning sessions

Contribution ID : 31

Type : **not specified**

## A study of the pentaquark states

*Monday, 1 July 2019 12:50 (30)*

The LHCb collaboration has reported recently three pentaquark states found in the  $J/\psi N$  mass distribution. Based on the constraints of the heavy quark spin symmetry combined with the local hidden gauge symmetry, we investigate the  $D^{(*)}\Sigma^{(*)}$  interactions, together with  $J/\psi N$  and other coupled channels, using a coupled channel approach. From the poles found in the second Riemann sheets, we dynamically reproduce the three states identified with the masses and the widths. Thus, we determine their quantum numbers and approximate molecular structure as  $1/2^- D^- \Sigma^0 c$ ,  $1/2^- D^- \Sigma^+ c$ , and  $3/2^- D^- \Sigma^+ c$ , and isospin  $I = 1/2$ . In our research procedure, we also predict some other states: (1) one  $3/2^- D^- \Sigma^+ c$  state with the mass of around 4374 MeV, for which indications appear in the experimental spectrum; (2) two other near degenerate states of  $1/2^- D^- \Sigma^+ c$  and  $3/2^- D^- \Sigma^+ c$ , found around 4520 MeV; (3) a  $5/2^- D^- \Sigma^+ c$  state, appeared at the same energy. Our findings also serve as a guide for further experimental studies.

**Presenter(s)** : [redacted], [redacted] (Central South Univesity)**Session Classification** : Morning sessions





Contribution ID : 32

Type : **not specified**

## Dark photon enlighten by kinetic mixing

*Monday, 1 July 2019 13:20 (30)*

I will review the current status of B anomalies and discuss possible new physics associated.

**Presenter(s)** : ,  (/

**Session Classification** : Morning sessions

Contribution ID : 33

Type : **not specified**

## xi and $\hat{p}_i$ as with Noncommutative Coordinates of the Quantum Physical/Phase Space

*Monday, 1 July 2019 16:00 (30)*

The proper model of our physical space behind quantum mechanics is the (projective) Hilbert space which is also the phase space. The key difference between quantum mechanics and classical mechanics is just the different phase space, an infinite dimensional curved space instead of a six dimensional flat space. The latter is amazing the classical approximation of the former. We obtained all those results from a relativity symmetry perspective. Here, I give a much more intuitive picture about that. I will discuss, in the talk, how the quantum physical/phase space can be seen also as a noncommutative geometry with six noncommutative coordinates and each as a quantum/noncommutative observable has the information content or value of infinite number of real numbers. That provide a complete resolution of the Einstein-Bohr debate which Einstein probably would like. The result has important implications for the physics and mathematics of quantum spacetime in general.

**Presenter(s) :** [redacted], [redacted]

**Session Classification :** Afternoon sessions

Contribution ID : 34

Type : **not specified**

## Ultrahigh Energy Cosmic Rays

*Monday, 1 July 2019 16:30 (30)*

I report the association of ultrahigh energy cosmic neutrinos with gamma ray bursts, and from which on what we can obtain for the Lorentz invariance violation and CPT violation.

**Presenter(s)** :   (Peking University)

**Session Classification** : Afternoon sessions

Contribution ID : 35

Type : **not specified**

## Quantum Correlation, Coherence & Uncertainty

*Monday, 1 July 2019 17:00 (30)*

Quantum correlations, quantum coherence and quantum uncertainty relations play significant roles in quantum information processing such as quantum communication and computation. The operational characterization of quantum correlations and quantum coherence are also the important aspects of the corresponding resource theory. We introduce some recent results on the theory of quantum entanglement; coherence quantifier; the relations among entanglement, coherence and particle-wave duality; as well as the related quantum uncertainty relations.

**Presenter(s)** : [redacted], [redacted] ([redacted])**Session Classification** : Afternoon sessions

